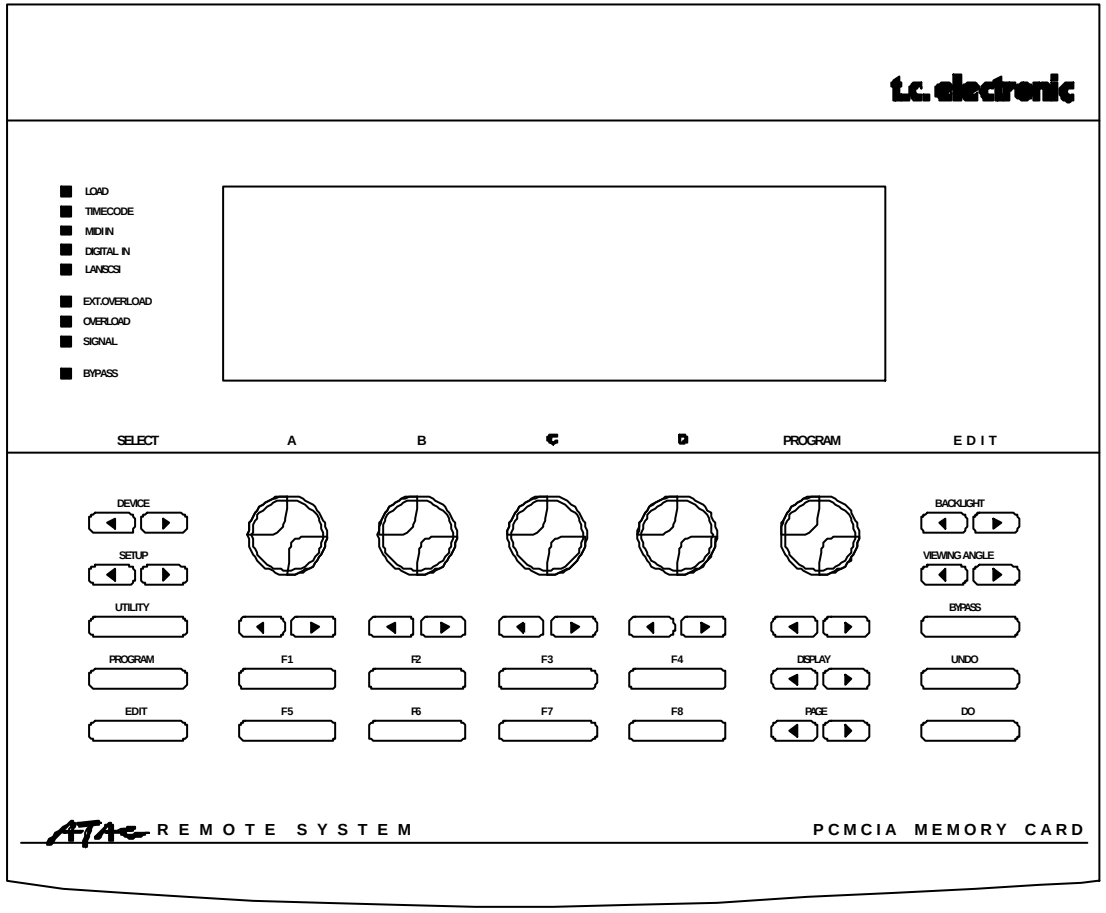

ATAC

Service Manual

3rd Edition

t.c. electronic

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Table of contents:

3rd Edition

Filename: ATACSMN3.DOC

Stock number: 605 0320 11

Introduction

The purpose of this manual is to support skilled technicians in repairing the ATAC

The manual begins with a Quick Trouble Shooting table. Here, hints, advice and possible problems are described.

If the problem is more serious, the next step is to use the Built-in Test Program. With this program the problem can often be narrowed down to a specific section or component.

The next section consist of disassembly and exchange procedures. Please be aware of warranty rights before disassembling. See the warranty card.

Circuit description is a brief description of the circuits on the different boards.

Circuit description is followed by a list with LED error codes.

The list with software changes states the corrections and additions for various software versions.

Finally the specifications are stated.

Appendix contains schematics, service notes, part lists, layouts etc.

Schematics start with a main sheet, where sub sheets are shown as blocks. Even sub sheets might have sub sheets. In the Schematics some connections have label names to help the reader. If a label name is framed, it means that it is "connected" to another sheet. Label names followed by the symbol "*" mean that the signal is active low, i.e. RESET*: the reset function takes place when the signal is low.

This service manual does not contain schematics for the external power supply.

Part lists contain a column called TCcode. Use this code when ordering spare parts. If the TCcode field is empty; it means the component cannot be ordered separately. The coordinates in the column Pos. refer to the PCB layout page. The column named Page refers to page no. in the schematics. In column comments a short explanation of the function is stated. For some components, alternative types are mentioned.

PCB layouts are made as gatefolds.

Finally appendix contains a spare part list for mechanical parts.

Quick Trouble Shooting:

Use this table to solve problems or find out what to do next.

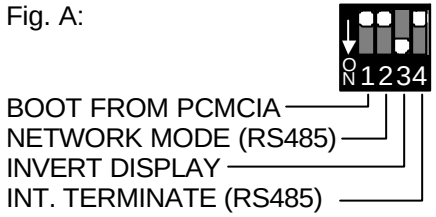
Symptom	Action:
Cannot connect to M5000/X.	Are the DIP switches set correctly? See section "DIP Switch Settings". Is the power up sequence correct? Powering up the ATAC and M5000/X at the same time may cause problems. Use this sequence: 1. Connect ATAC to the M5000/X or to the MULTAC. 2. If MULTAC is used connect this to M5000, otherwise goto step 3 3. Turn on M5000/X. Wait 5 seconds. 4. Turn on the ATAC. Check M5000/X internal fuse. The fuse F1 is located inside the M5000/X, at the CPU board close to the Remote connector. Fuse size: T 630mA.
Blank display. Cannot run application software.	Load the application software again. To enter the load menu, press DO at power on
No light in LED's. Bad keys or encoders.	Try to run the Built-in Test program. See section "Built-in Test program".
Hum or Noise in Audio, when connected to M5000/X	Install software v.1.24 or higher. Make sure there is no ground loops or disconnect the shield wire in the cable connecting the ATAC to the M5000/X.
Message: "Serial no. corrupted"	Serial no. data is lost, normally caused by electric shock. The unit works fine without the serial no. data. Just abort error message. To re-install serial no. data; use special PCMCIA service card.
LD1, LD2 or LD3 at main board is lit	See section "LED Error Codes"
Lines and spots in display, when power is off	Disconnect the remote cable if you are using the M5000/X without the ATAC for longer times. Otherwise a small DC current will run to the ATAC. Over long period, the current may cause damage to the display.
Midi no function	Midi functions are not implemented in ver. 1.24 or lower. Use Midi connectors at M5000.

DIP Switch settings:

The ATAC is fitted with four DIP switches for controlling the Boot Mode, Network Mode and Display Mode. The switches are accessible at the back panel.

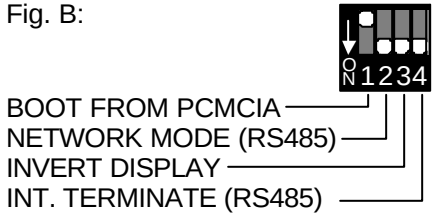
The setting shown in figure A is: off, off, on ,off. This setting is used for connecting the ATAC directly to a M5000.

Fig. A:



The setting shown in figure B is: off, on ,on, on. This setting is used for connecting the ATAC to a MULTAC.

Fig. B:



Switch #1, Boot mode:

OFF Normal Boot mode.

ON Service Boot mode. Requires special PCMCIA service card[1].

Switch #2, Network mode[2]:

OFF single mode; for controlling only one M5000 directly.

ON RS485 mode; used when connected to MULTAC.

Switch #3, Display mode:

OFF for inverted LCD

ON for normal mode.

Switch #4, Termination[2]:

OFF single mode termination; for controlling only one M5000 directly.

ON RS485 mode termination; used when connected to MULTAC.

Note 1: Powering up without PCMCIA service card may cause application software to corrupt.

Note 2: Switch #2 & 4 must always be set to matching positions.

Built-in Test Program:

The ATAC has a Built-in Test Program. Use the program to narrow down problems with keys, encoders, LED's etc.

To run the program; press UNDO while powering up.

Follow the instructions on the display.

To leave the Built-in Test Program; turn off power.

ATAC Built-in Test Program Version 1.01 has following tests:

1. Display
2. Midi connection (automatic, uses internal relay)
   Notice: Midi functions are not implemented in software version 1.24 or lower.
3. Remote connection (automatic, uses internal relay)
4. Keys
5. Encoders (dial knobs)
6. LED's (indicators)
7. Voltages

The voltage labels refers to labels in schematics. Some voltages are attenuated to protect the test circuit. When measuring manually, measurements must take place before the attenuators (marked with dash lines in schematics) to match the above voltage limits.

Voltage limits in automatic voltage test:

Voltage label	limits
U-PSIN:	+7.5 to +15.5 VDC
U-REMIN:	+4.7 to +5.1 VDC *
U+5V:	+2.17 to 2.25 VDC
U-NEGATIV:	-14.2 to -12.8 VDC
U-CONT:	-8.67 to -7.83 VDC
U-BATT:	+3.0 to +4.0 VDC
UCC-PCMCIA1:	0.0 to +0.3 VDC
UCC-PCMCIA2:	+4.8 to +5.0 VDC
CC-PCMCIA3:	+11.4 to +12.4 VDC

* U-REMIN will fail test, if D13 is removed. See part list.

Disassembly procedure

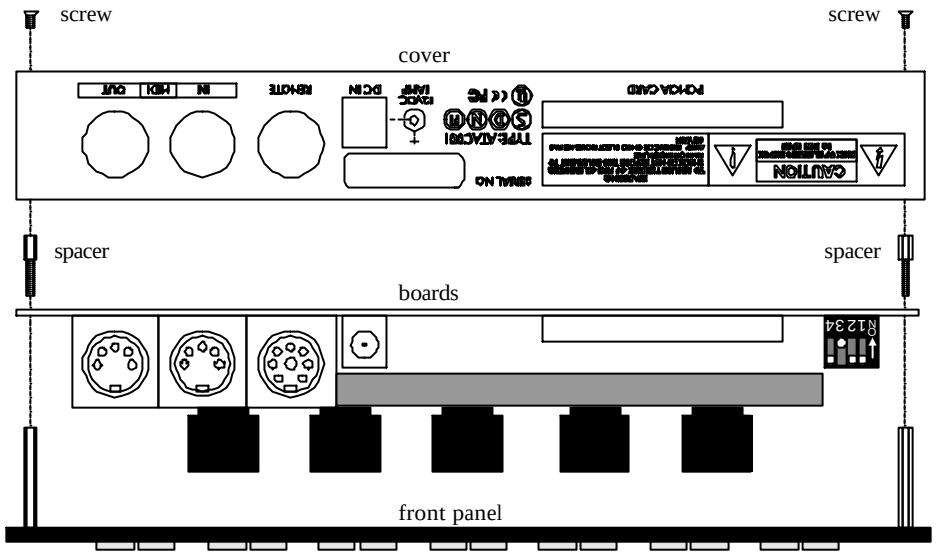
Disconnect power before disassembling.

1. Place the ATAC with the front panel facing down. In this way the buttons will stay in the front panel when the boards are removed, see fig. 1.
2. Loosen four screws at the bottom, one in each corner
3. Remove the cover.
4. Remove the protection plastic in one corner. The plastic protects against electric shock from the terminals for backlight.
5. Remove four spacers, one in each corner.
6. Lift up gently the boards, make sure the front panel stays on the table. DO NOT turn around the front panel, all the buttons are loose!
7. To remove the switch board (PC7002-x); loosen five screws and solder out the pins at J2.
8. To remove the display; loosen four screws and solder out the two wires for backlight.
   Note: The software cannot run without the display. An extension cable is therefore very useful for doing trouble shooting while the unit is running.

Disassembling gives access to do measurements at all components.

WARNING: Do not touch the terminals at JP1. High voltage for backlight!

Fig. 1: Disassembling of ATAC.



Exchange of battery:

CAUTION:

DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH SAME OR EQUIVALENT TYPE RECOMMEND BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURERS INSTRUCTIONS.

VARNING:

Felaktigt batteribyte kan medfora fara for explosion. Anvand darfor endast samma typ eller likvardig typ enligt apparattillverkarens rekommendation.

Kassera forbrukade batterier enligt tillverkarens anvisning

ADVARSEL:

Lithiumbatteri. Eksplosionsfare ved fejlagtig håndtering. Må kun udskiftes med batteri af samme fabrikat og type.

Lever det brugte batteri tilbage til leverandøren.

Recommended battery type: CR2032.

TC stock no. (TCcode) for battery: 342 0000 11

Exchange procedure:

1. **Turn Off Power and Disconnect Power Cord.**
2. Place the ATAC with the front panel facing down. In this way the buttons will stay in the front panel when the cover is removed, see fig. 1.
3. Loosen four screws at the bottom. and remove the cover
4. Desolder the old battery by warming up each terminal one by one. Avoid any short circuit of the terminals. Be careful not to damage the wiring on the board.
5. Insert new battery and solder the terminals one by one. Avoid any short circuit of the terminals.
6. The voltage measured directly across the terminals of the new battery should be higher than 3.0VDC.
7. Do not discard the old battery. Hand it over to a recycling company or your dealer.

Circuit description:

The ATAC consist of a main board, a keys board, a LED board and a display. Here is a brief description of the boards:

The main board has seven sections: CPU, Connection to Front, Memory, Connection to Display, Power Supply, Interface, Jeida Connector.

The CPU section consist of the CPU, IC1 and some discrete components. The five encoders and the three error code LEDS are connected directly to the CPU

Connection to Front: Some latches takes care of the communication to the LED board and to/from the keyboard.

Memory consist of two RAM ICs and one Flash IC. The RAM is working memory for the CPU and the Flash contain the program for the CPU. The Flash program can be updated from PCMCIA card or via the remote cable from a M5000

Connection to Display: IC17, a DC/DC converter produces a negativ voltage. This voltage is used by the op-amp, IC16, which controls the contrast voltage for the display.
The transformer TR1 generates the backlight voltage.
The negative-, contrast- and backlight voltage can be checked by the CPU, for instance when running the Build in Test Program.

Power Supply: The ATAC can be supplied from either the DC-in socket or from the Remote connector. The external transformer produces an unregulated DC voltage. This voltage is regulated to a clean 5VDC by IC18.
IC 19 controls the reset function and battery back-up for the RAM.
Four different voltages in the power supply can be checked by the CPU.

Interface consist of Midi and Remote connection. The Midi connectors has no function. They are not implemented in software version 1.24 or lower. The two relays RL1 & 2 are only used for the Build in Test program

Jeida Connector: The circuit between CPU and Jeida is reduced by using a PAL, IC12.

The Keys board: Here are all the keys located. The keys are scanned in a 5 x 8 matrix.

The LED board is simply fitted with 9 LEDs.

The Display has two connections, one for communication and one for back light voltage.
WARNING: High Voltage. Do not touch the back light termnals!

LED error codes:

At each power up, the ATAC runs several tests.

If an error occurs 3 LED's at the main board will show an error code. Use the table below for decoding error codes.

LD1	LD2	LD3	Code explanation	Action
off	off	off	The CPU is running OK (all LED's blink once and LD3 is lit for a moment at reset,)	
on	off	off	The program encountered an Error while checking its own code	Load the application software again.
off	on	off	Errors detected while writing to and reading back from the static ram	Check IC 9 & 11.
on	on	off	Errors detected while writing to and reading back from the LCD display memory	Check connector J1 and the LCD.
on	off	on	The voltages U-PSIN, U-REMIN or U+5V were out of range	Measure the voltages with a multimeter. See section Built-in-Test Program for Voltage limits
off	on	on	Errors were detected while erasing and programming Flash	Check IC10
off	off	on	Load menu is selected	Load software from network or PCMCIA card

Software Changes:

Listed below are changes in the application software for the ATAC.

Filename for application software is AP1-Vxxx.ATC (xxx represents the version no.)

changes from version 1.20 to 1.21:

- SMPTE update playing/recording etc.
- digital_in led and other yet not used LED's off when close Conn.
- corrected bug with search while late connection
- ATAC sometimes hanging in semaphore, not corrected completely before v1.22
- corrected procedure in trying to connect to just started frame
- now able to handle M5000X Frames

changes from version 1.21 to 1.22:

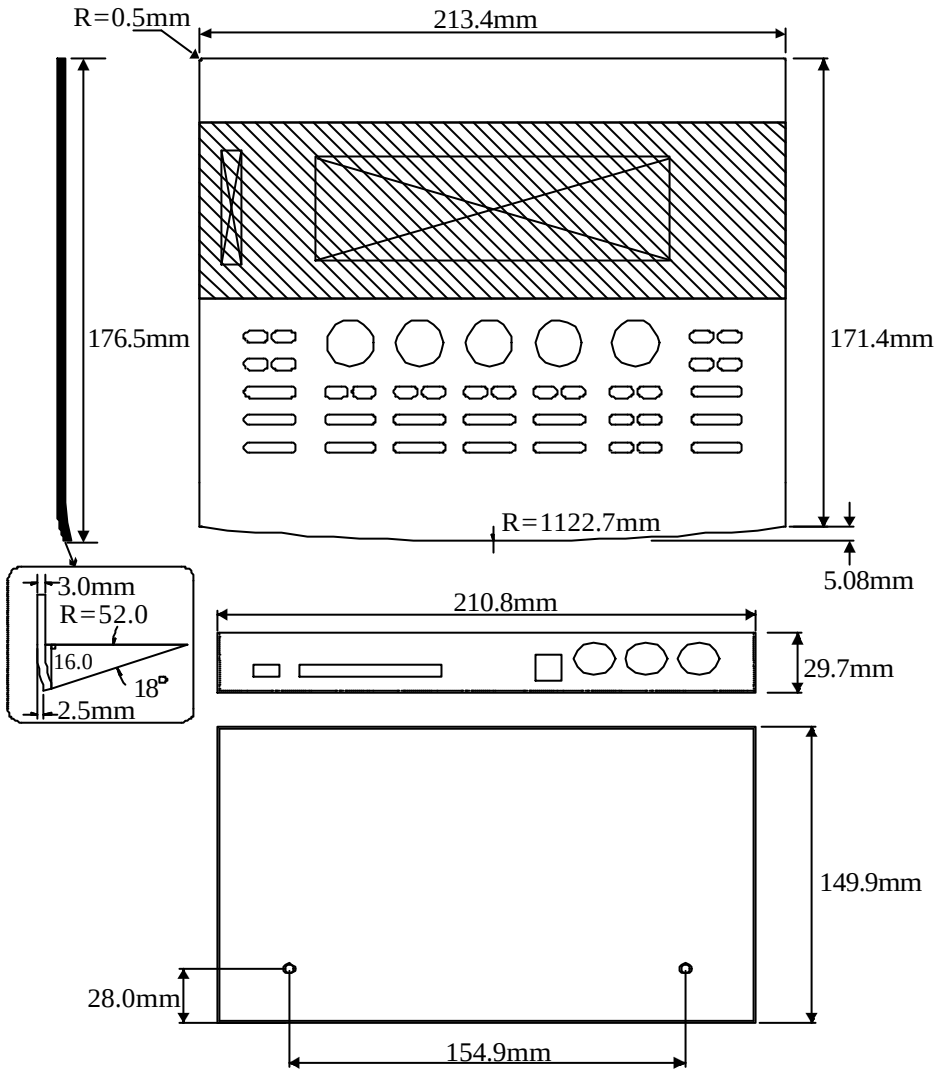
- improved handling of M5000X Frames
- SMPTE stopped implemented not --:--:--:--
- ATAC sometimes hanging is corrected
- pitch-1 & 2 algorithm extended with one page

changes from version 1.22 to 1.24:

- handling of backlight changed to avoid Audio Noise. Switching frequency changed from approx. 400Hz to 24kHz
- multitask bug corrected

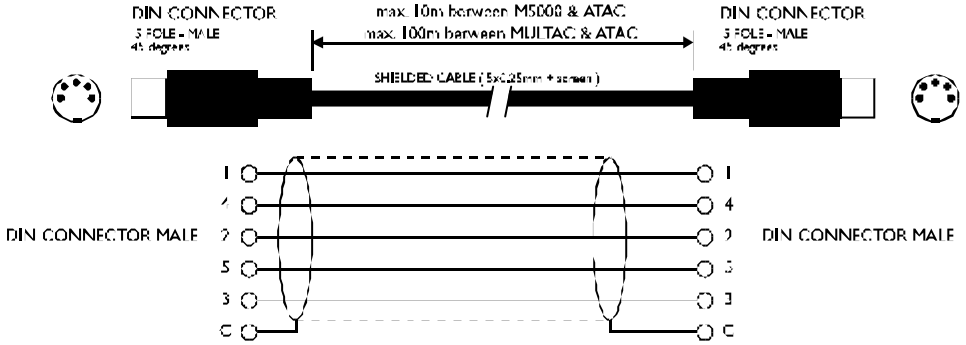
Technical Specifications:

Environment:	Operating, 0° to 50° C
	Storage, -20° to 60° C
Power Requirements:	12 VDC, 1 Amp., negative at tip!
DC in socket:	3.5mm mini Jack, tip 2.1mm .
Midi sockets:	5 pin DIN 45° Female
Remote socket:	7(8) pin DIN 45° Female
Display:	240 x 60 dot LCD cold cathode backlit
PCMCIA Slot:	Type I Memory Cards
Dimensions:	8.4 x 6.9 x 1.6 inches
	(213.4 x 176.5 x 40.2 mm)
Finish:	Black anodized aluminum face plate
	Black painted steel chassis
	Durable foam base pad
Back-up battery:	CR2032 lithium battery, life time; >10 years
Net Weight:	2.4 lbs. (1.1kg)
Shipping Weight:	6.6 lbs. (3 kg)

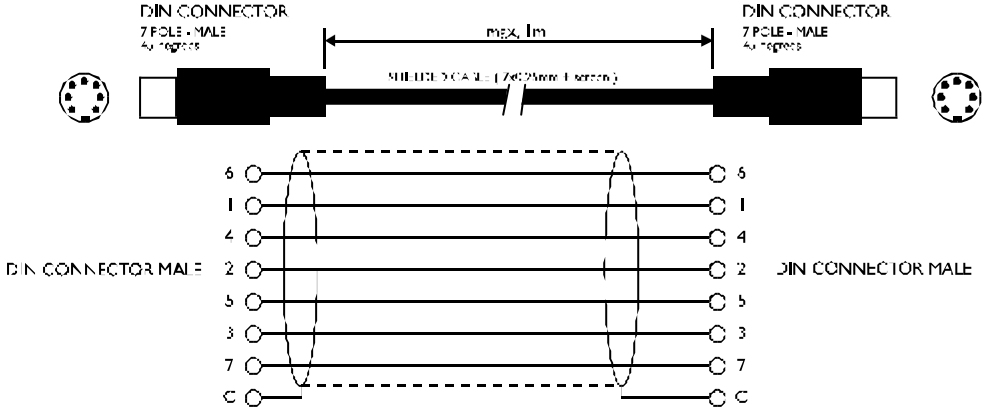


Specifications for cables:

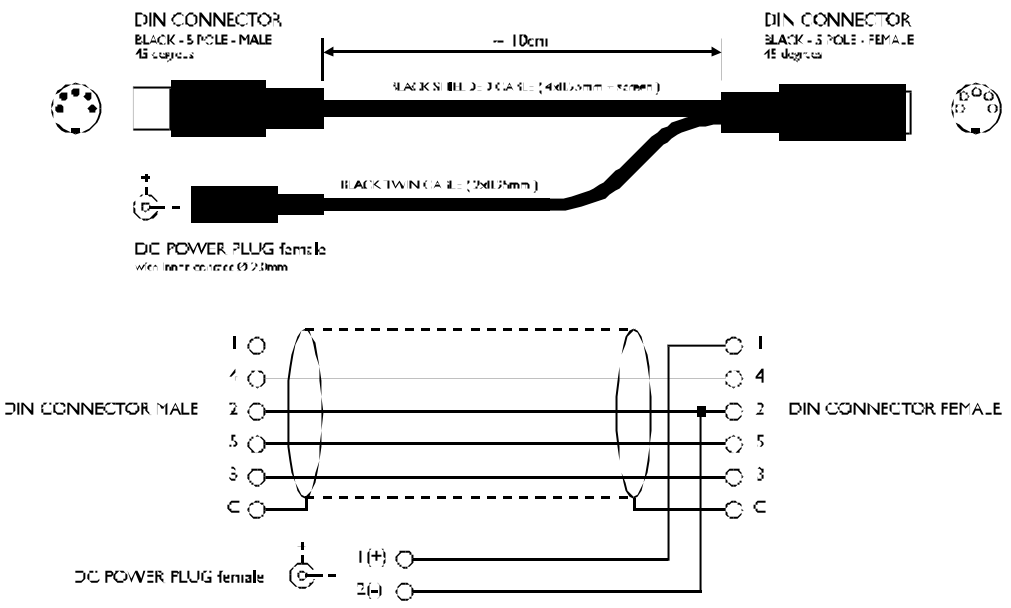
Cable for connecting ATAC to M5000/X or to MULTAC:



Cable for connecting M5000/X to MULTAC:

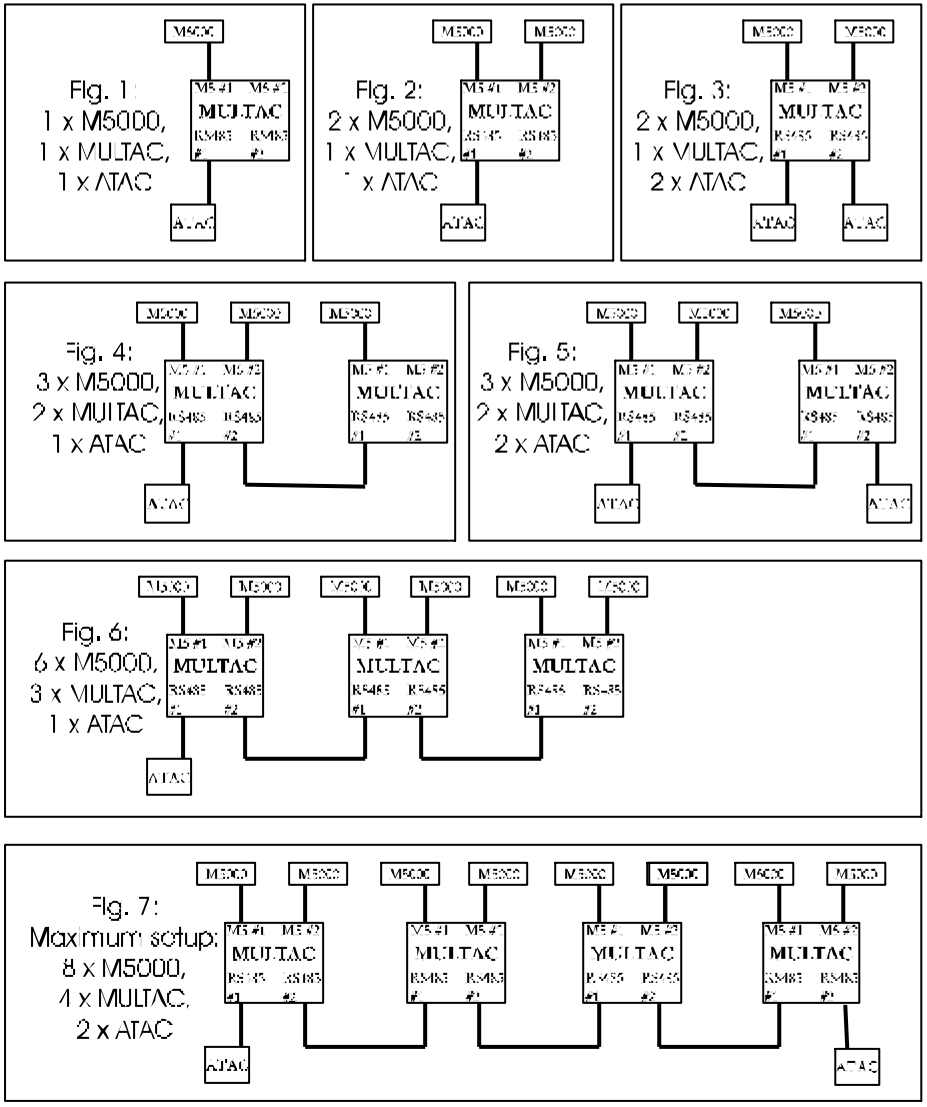


Split-cable for connecting Power Supply to ATAC:



Multiple ATAC / M5000 setup:

Here are some examples with MULTACs in different setups:

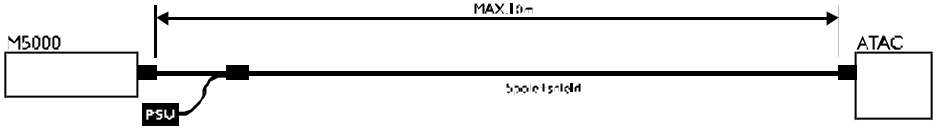


Maximum cable lengths.

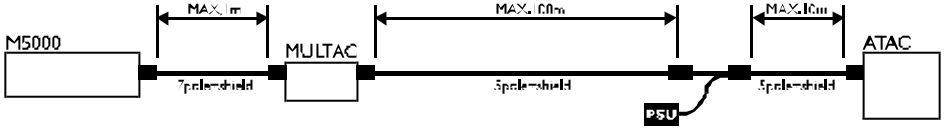
There are five rules for cable lengths:

1. Cable length between M5000 and MULTAC:	max. 1 meter.
2. Cable length between ATAC and Power Supply:	max. 10 meter / 33 ft.
3. Cable length between ATAC and M5000:	max. 10 meter / 33 ft.
4. Cable length between ATAC and MULTAC:	max. 100 meter / 328 ft.
5. Cable length between two MULTACs:	max. 100 meter / 328 ft..

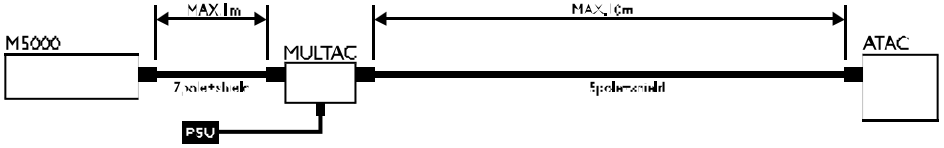
Here are some examples for maximum cable length.
Ex. 1: Classic setup with a M5000 and one ATAC. (rule 2 and 3)



Ex. 2: Typical MULTAC setup. (rule 1, 2 and 4).

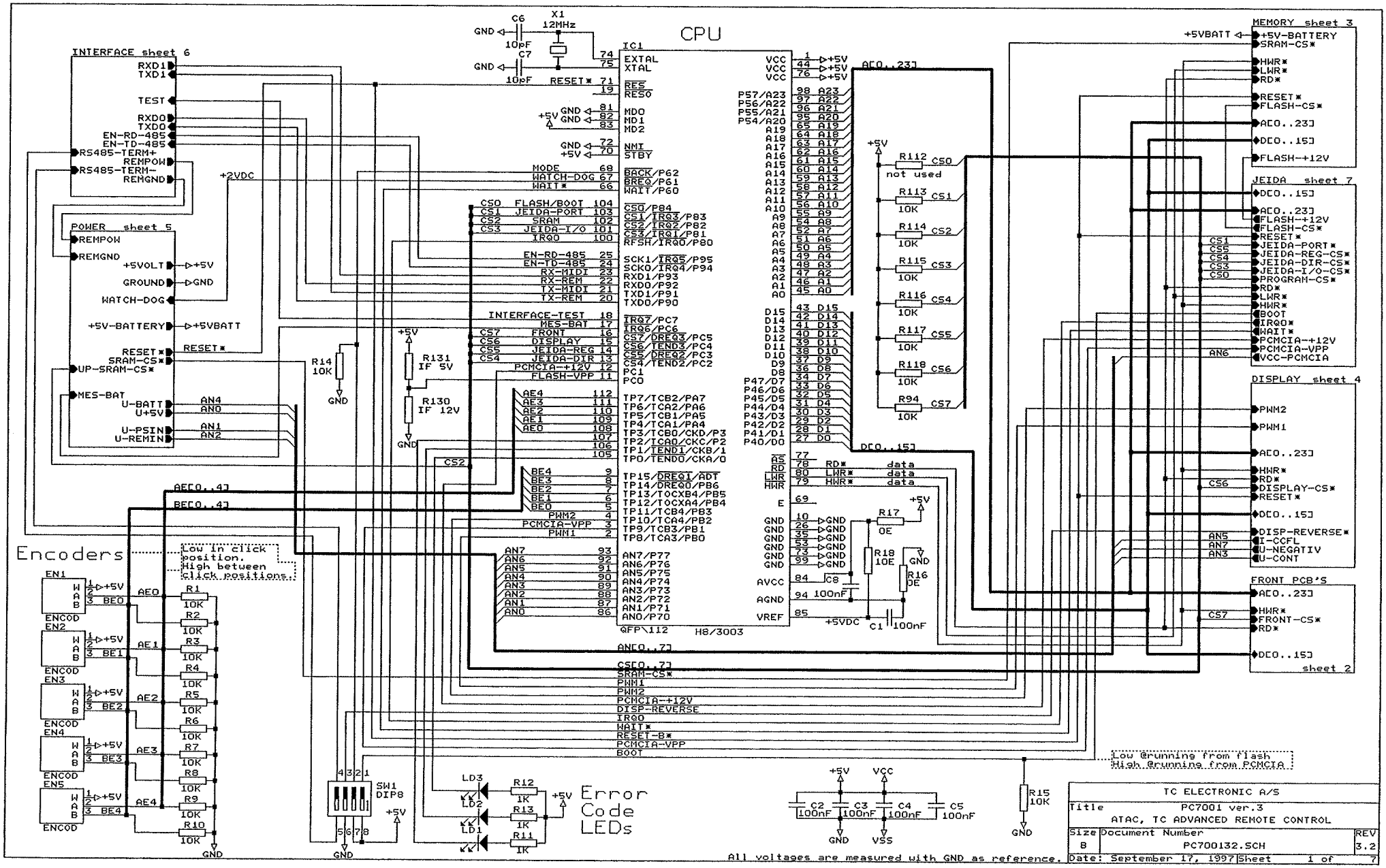


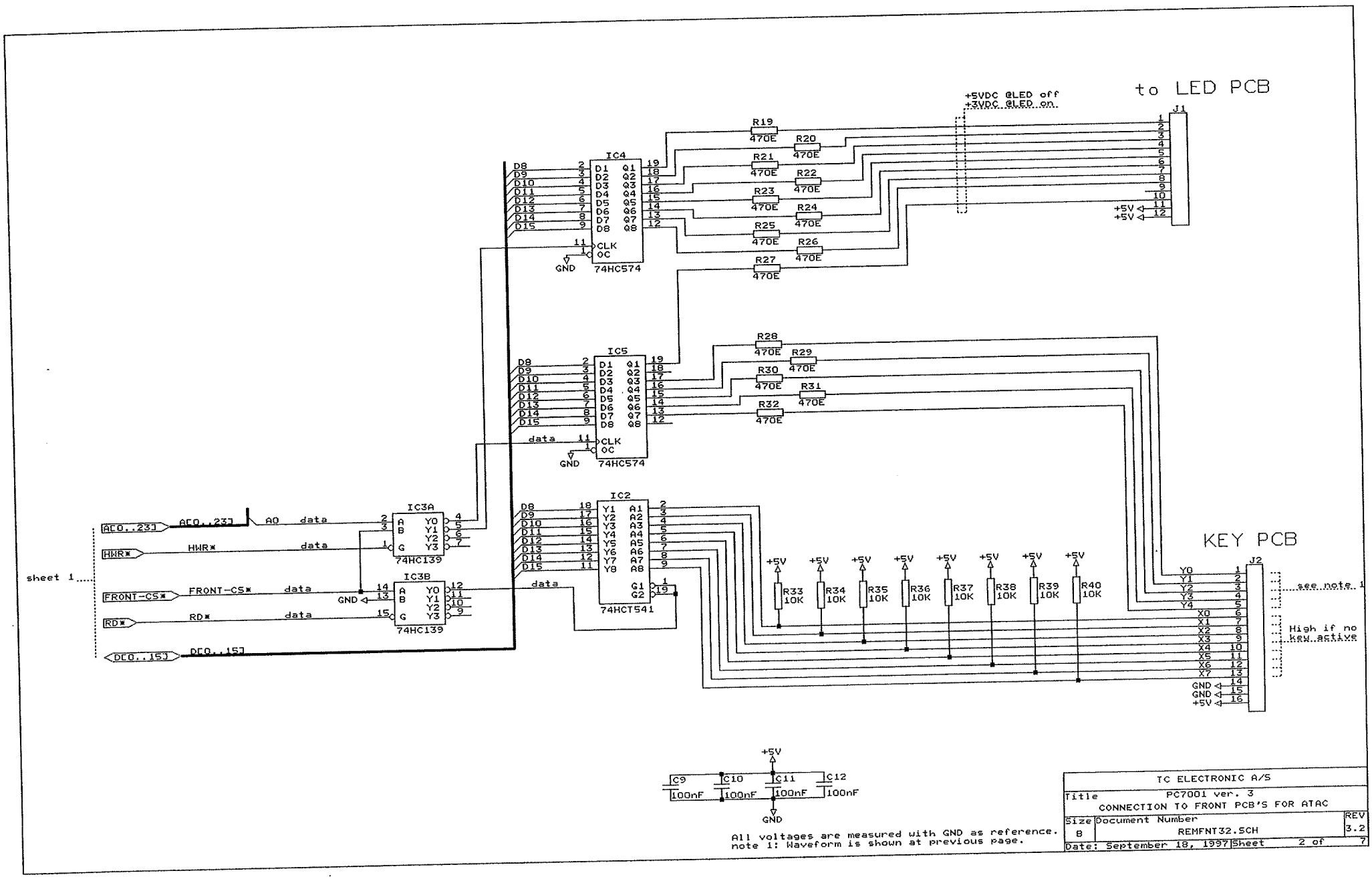
Ex. 3: A setup with power supply connected to the MULTAC. (rule 1,2 and 4)

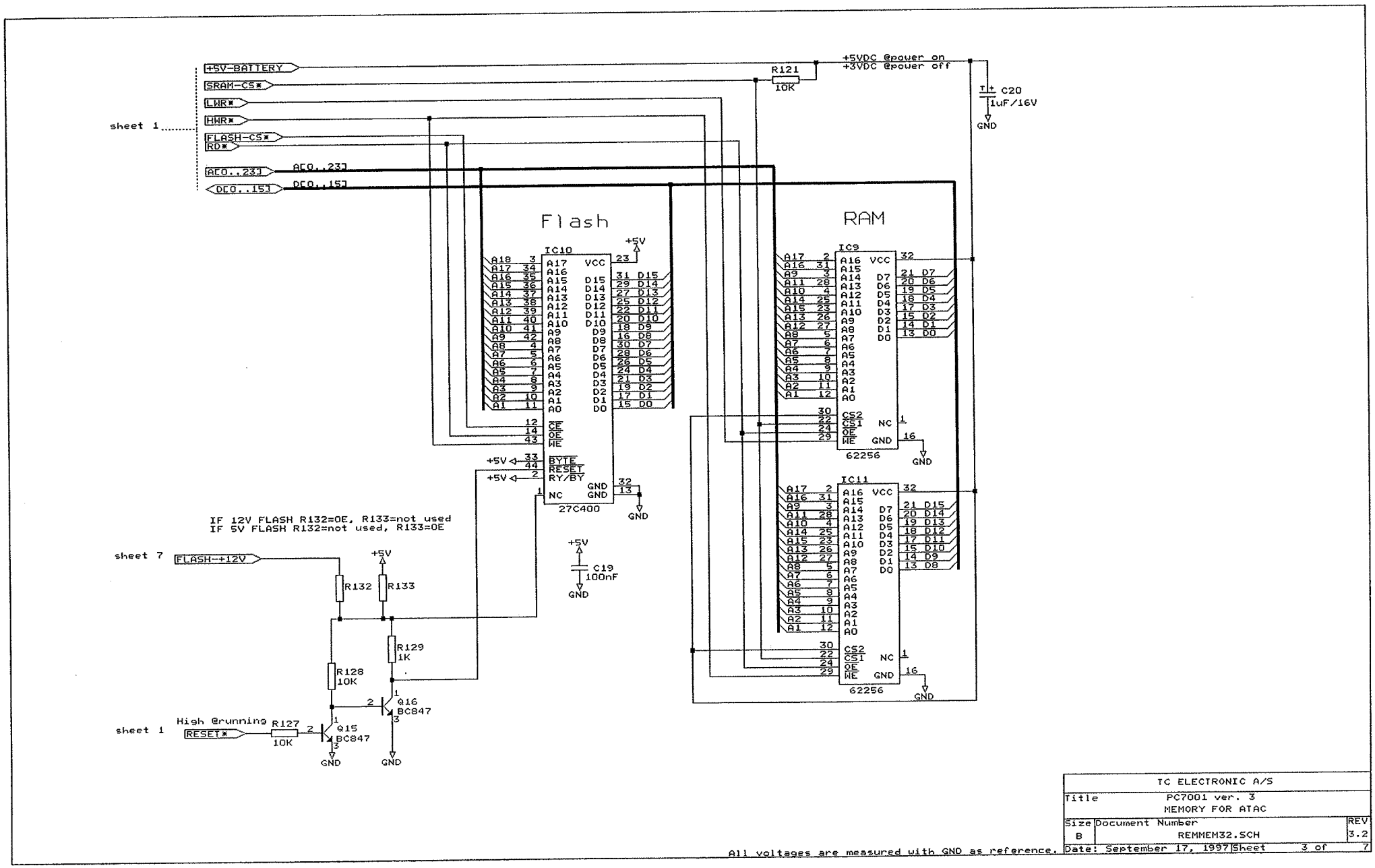


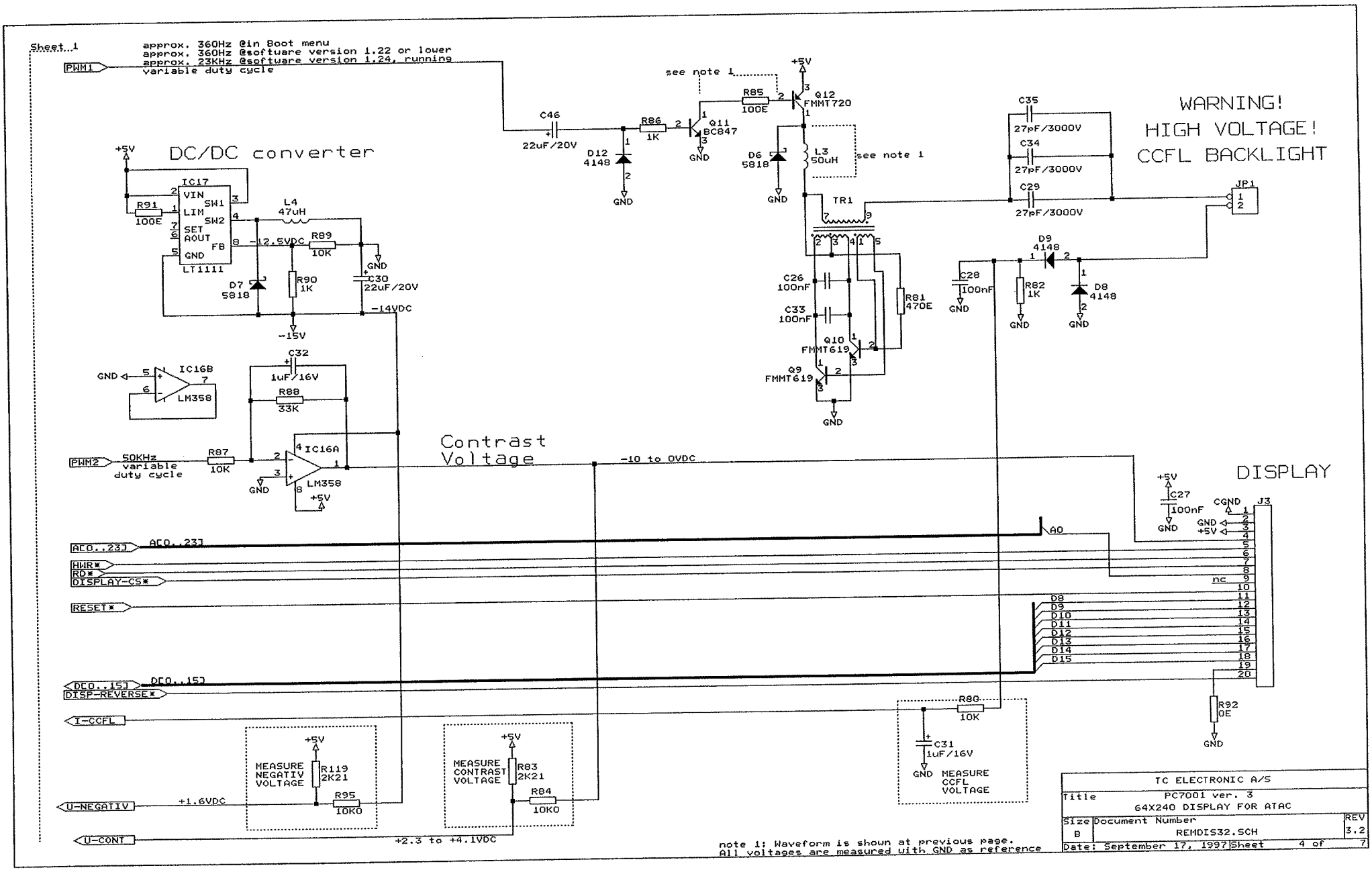
Appendix list: schematics, service notes, part lists and PCB layouts

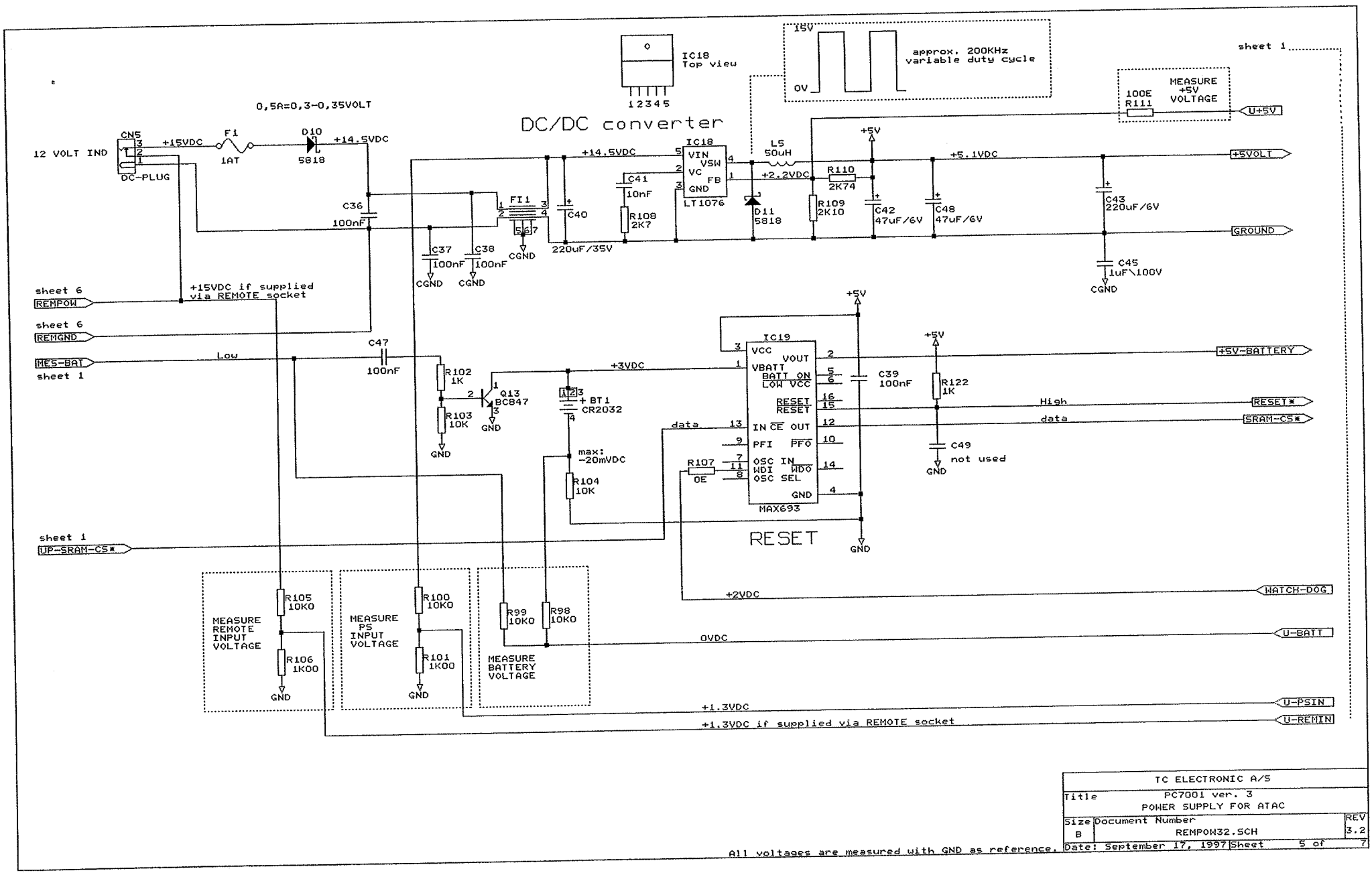
Schematic for Main board ver. PC7001-ver. 3	7 pages
Part list for Main board ver. PC700131	9 pages
PCB layout for Main board ver. PC7001 v. 3	1 page
Schematic for Main board ver. PC7001 ver. 2	7 pages
Service note 708 10 00 01 for PC7001 ver. 2	1 page
Part list for Main board ver. PC700120	8 pages
PCB layout for Main board ver. PC7001 v. 2	1 page
Schematic for Keys & LEDs board ver. PC700230	1 page
Part list for Keys & LEDs board ver. PC700230	2 pages
PCB layout for Keys & LEDs board PC7002 ver. 2	1 page
Part list for mechanical parts in ATAC	1 page


CPU
IC1
H8/3003
QFP\112
INTERFACE sheet 6
POWER sheet 5
MEMORY sheet 3
JEIDA sheet 7
DISPLAY sheet 4
FRONT PCB'S
sheet 2
Encoders
Low in click position.
High between click positions.
Error Code LEDs
SW1 DIP8
Low @running from flash
High @running from PCMCIA
All voltages are measured with GND as reference.
TC ELECTRONIC A/S
Title PC7001 ver.3
ATAC, TC ADVANCED REMOTE CONTROL
Size B
Document Number PC700132.SCH
REV 3.2
Date: September 17, 1997
Sheet 1 of 7

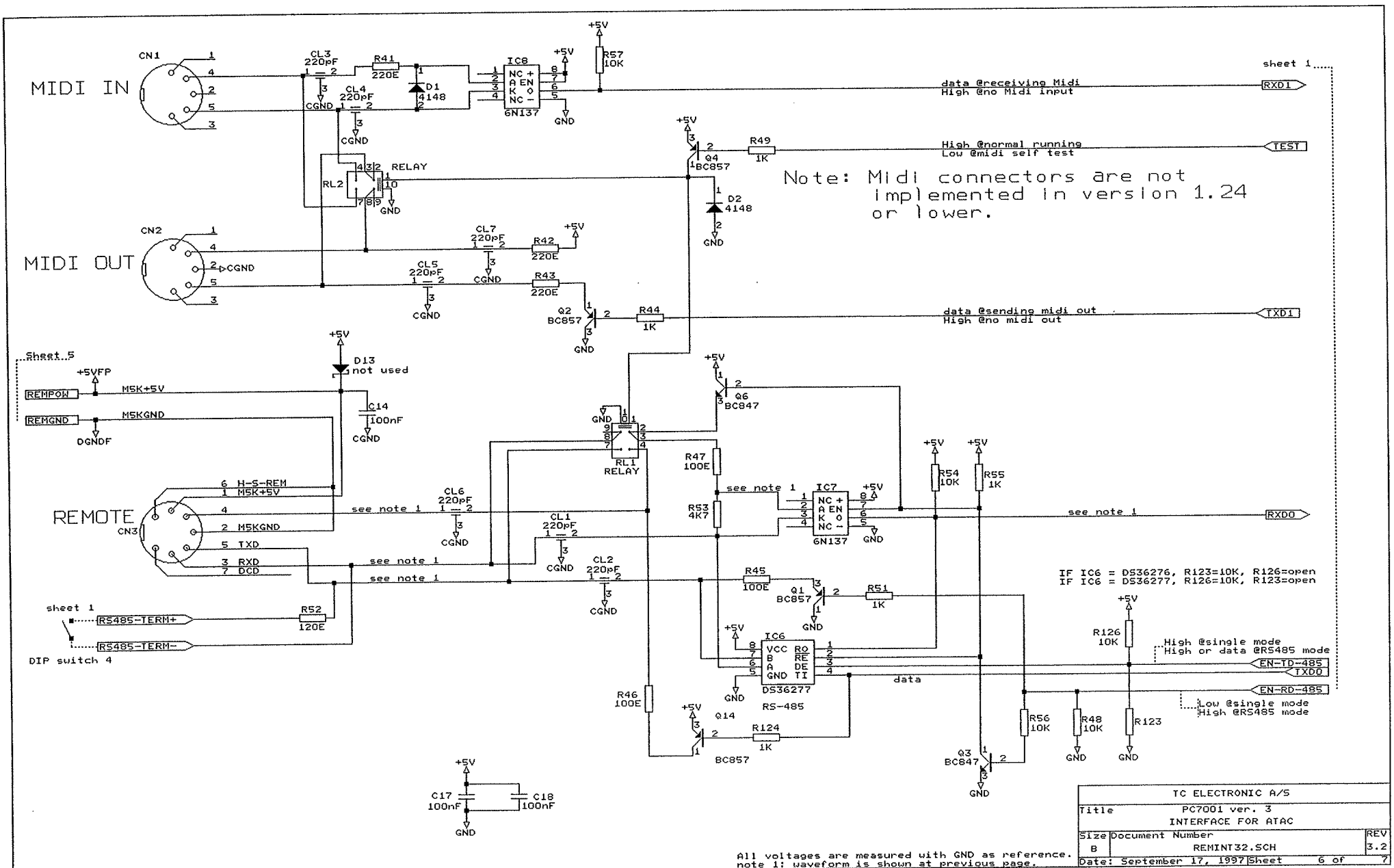

to LED PCB
+5VDC @LED off
+3VDC @LED on
J1
IC4
74HC574
R19 470E
R20 470E
R21 470E
R22 470E
R23 470E
R24 470E
R25 470E
R26 470E
R27 470E
IC5
74HC574
R28 470E
R29 470E
R30 470E
R31 470E
R32 470E
IC3A
IC3B
74HC139
IC2
74HCT541
R33 10K
R34 10K
R35 10K
R36 10K
R37 10K
R38 10K
R39 10K
R40 10K
KEY PCB
J2
see note 1
High if no key active
sheet 1
A[0..23]
HWR*
FRONT-CS*
RD*
D[0..15]
data
C9 100nF
C10 100nF
C11 100nF
C12 100nF
All voltages are measured with GND as reference.
note 1: Waveform is shown at previous page.
TC ELECTRONIC A/S
Title PC7001 ver. 3
CONNECTION TO FRONT PCB'S FOR ATAC
Size B
Document Number REMFNT32.SCH
REV 3.2
Date: September 18, 1997
Sheet 2 of 7

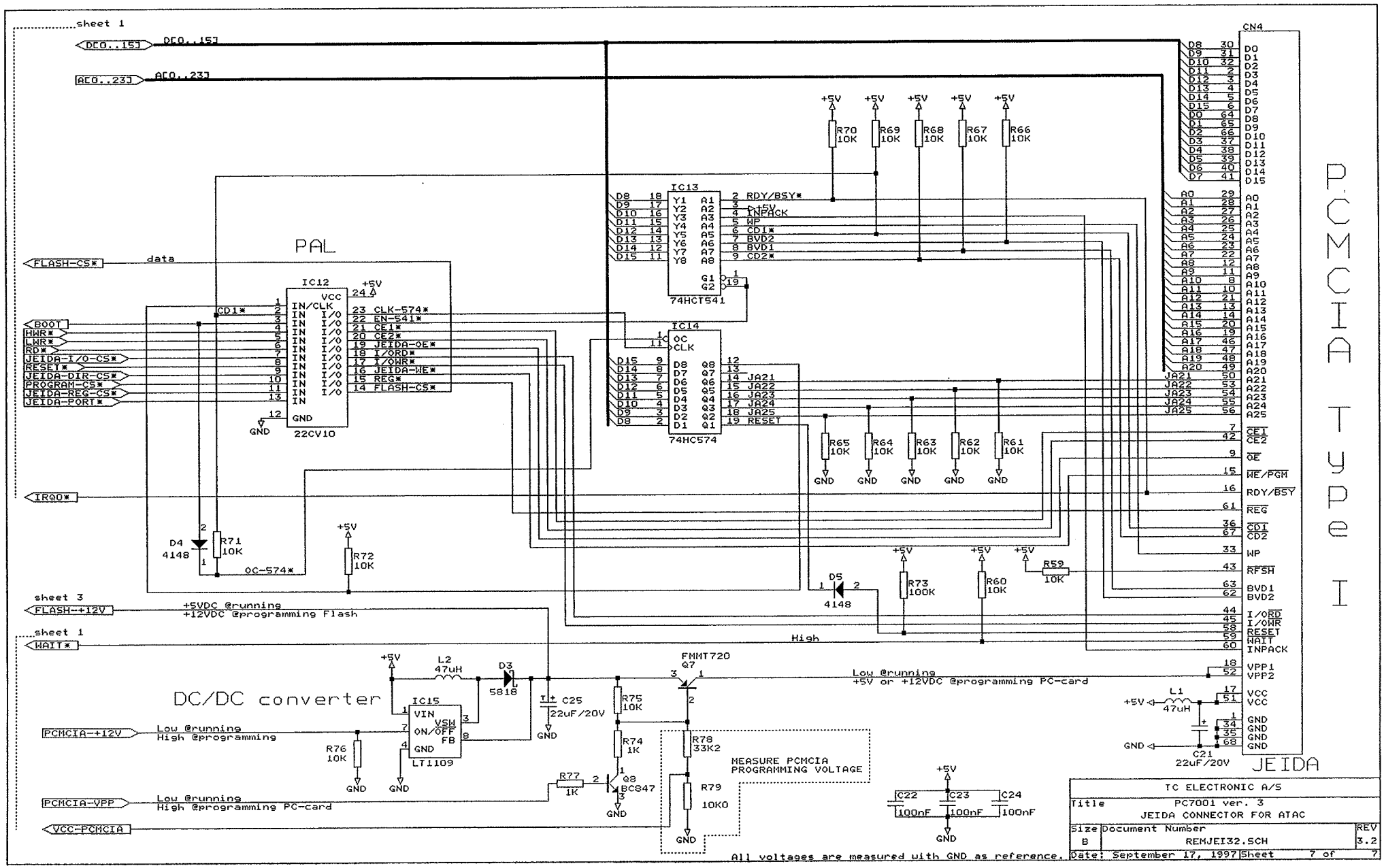

+5V-BATTERY
SRAM-CS*
LWR*
HWR*
FLASH-CS*
RD*
A[0..23]
D[0..15]
sheet 1
R121
10K
+5VDC @power on
+3VDC @power off
C20
1uF/16V
GND
Flash
RAM
IC10
27C400
IC9
IC11
62256
62256
+5V
BYTE
RESET
RY/BY
CE
OE
WE
CS2
CS1
NC
VCC
GND
IF 12V FLASH R132=0E, R133=not used
IF 5V FLASH R132=not used, R133=0E
sheet 7
FLASH-+12V
R132
R133
C19
100nF
R129
1K
R128
10K
Q16
BC847
High @running
R127
10K
Q15
BC847
RESET*
sheet 1
GND
All voltages are measured with GND as reference.
TC ELECTRONIC A/S
Title
PC7001 ver. 3
MEMORY FOR ATAC
Size
B
Document Number
REMMEM32.SCH
REV
3.2
Date: September 17, 1997
Sheet
3 of
7


Sheet 1
approx. 360Hz @in Boot menu
approx. 360Hz @software version 1.22 or lower
approx. 23KHz @software version 1.24, running
variable duty cycle
PWM1
DC/DC converter
IC17
LT1111
L4
47uH
R91
100E
R89
10K
R90
1K
D7
5818
C30
22uF/20V
-12.5VDC
-14VDC
-15V
C46
22uF/20V
D12
4148
R86
1K
Q11
BC847
see note 1
R85
100E
Q12
FMMT720
+5V
GND
D6
5818
L3
50uH
TR1
C35
27pF/3000V
C34
27pF/3000V
C29
27pF/3000V
JP1
WARNING!
HIGH VOLTAGE!
CCFL BACKLIGHT
C26
100nF
C33
100nF
R81
470E
Q10
FMMT619
Q9
FMMT619
C28
100nF
R82
1K
D9
4148
D8
4148
IC16B
LM358
C32
1uF/16V
R88
33K
PWM2
50KHz
variable
duty cycle
R87
10K
IC16A
LM358
Contrast
Voltage
-10 to 0VDC
DISPLAY
C27
100nF
CGND
J3
A0
AD0..23]
HWR*
RD*
DISPLAY-CS*
RESET*
nc
D8
D9
D10
D11
D12
D13
D14
D15
DD0..15]
DISP-REVERSE*
I-CCFL
R92
0E
R80
10K
C31
1uF/16V
MEASURE
CCFL
VOLTAGE
MEASURE
NEGATIV
VOLTAGE
R119
2K21
R95
10KO
U-NEGATIV
+1.6VDC
MEASURE
CONTRAST
VOLTAGE
R83
2K21
R84
10KO
U-CONT
+2.3 to +4.1VDC
note 1: Waveform is shown at previous page.
All voltages are measured with GND as reference
TC ELECTRONIC A/S
Title
PC7001 ver. 3
64X240 DISPLAY FOR ATAC
Size
B
Document Number
REMDIS32.SCH
REV
3.2
Date: September 17, 1997
Sheet
4 of
7



TC ELECTRONIC A/S		
Title	PC7001 ver. 3 POWER SUPPLY FOR ATAC	
Size: B	Document Number: REMPOW32.SCH	REV: 3.2
Date: September 17, 1997	Sheet 5 of 7	


MIDI IN
CN1
CL3 220pF
CL4 220pF
R41 220E
D1 4148
IC8 6N137
R57 10K
data @receiving Midi
High @no Midi input
RXD1
R49 1K
Q4 BC857
High @normal running
Low @midi self test
TEST
RELAY
RL2
D2 4148
Note: Midi connectors are not implemented in version 1.24 or lower.
MIDI OUT
CN2
CL7 220pF
CL5 220pF
R42 220E
R43 220E
Q2 BC857
R44 1K
data @sending midi out
High @no midi out
TXD1
Sheet 5
+5VFP
REMPOW
M5K+5V
REMGND
M5KGND
DGNDF
D13 not used
C14 100nF
REMOTE
CN3
6 H-S-REM
1 M5K+5V
4
2 M5KGND
5 TXD
3 RXD
7 DCD
CL6 220pF
CL1 220pF
CL2 220pF
see note 1
RL1 RELAY
Q6 BC847
R47 100E
R53 4K7
IC7 6N137
R54 10K
R55 1K
RXD0
R45 100E
Q1 BC857
R51 1K
IF IC6 = DS36276, R123=10K, R126=open
IF IC6 = DS36277, R126=10K, R123=open
sheet 1
RS485-TERM+
RS485-TERM-
R52 120E
DIP switch 4
IC6 DS36277
RS-485
R126 10K
High @single mode
High or data @RS485 mode
EN-TD-485
TXD0
EN-RD-485
Low @single mode
High @RS485 mode
data
R46 100E
Q14 BC857
R124 1K
R56 10K
R48 10K
R123
Q3 BC847
C17 100nF
C18 100nF
GND
All voltages are measured with GND as reference.
note 1: waveform is shown at previous page.
TC ELECTRONIC A/S
Title PC7001 ver. 3
INTERFACE FOR ATAC
Size B
Document Number REMINT32.SCH
REV 3.2
Date: September 17, 1997
Sheet 6 of 7


sheet 1
DC0..15J
DC0..15J
AC0..23J
AC0..23J
CN4
PCMCIA type I
JEIDA
PAL
IC12
22CV10
IC13
74HCT541
IC14
74HC574
FLASH-CS*
data
BOOT
HWR*
LWR*
RD*
JEIDA-I/O-CS*
RESET*
JEIDA-DIR-CS*
PROGRAM-CS*
JEIDA-REG-CS*
JEIDA-PORT*
IRQ0*
CD1*
OC-574*
CLK-574*
EN-541*
CE1*
CE2*
JEIDA-OE*
I/ORD*
I/OWR*
JEIDA-WE*
REG*
FLASH-CS*
RDY/BSY*
INPACK
WP
CD1*
BVD2
BVD1
CD2*
JA21
JA22
JA23
JA24
JA25
RESET
R70 10K
R69 10K
R68 10K
R67 10K
R66 10K
R65 10K
R64 10K
R63 10K
R62 10K
R61 10K
R71 10K
R72 10K
R73 100K
R60 10K
R59 10K
D4 4148
D5 4148
sheet 3
FLASH-+12V
+5VDC @running
+12VDC @programming Flash
sheet 1
WAIT*
High
DC/DC converter
IC15
LT1109
L2 47uH
D3 5818
C25 22uF/20V
FMMT720
Q7
R75 10K
R74 1K
R78 33K2
R79 10K0
R77 1K
Q8 BC847
R76 10K
PCMCIA-+12V
Low @running
High @programming
PCMCIA-VPP
Low @running
High @programming PC-card
VCC-PCMCIA
Low @running
+5V or +12VDC @programming PC-card
MEASURE PCMCIA
PROGRAMMING VOLTAGE
L1 47uH
C21 22uF/20V
C22 100nF
C23 100nF
C24 100nF
All voltages are measured with GND as reference.
TC ELECTRONIC A/S
Title
PC7001 ver. 3
JEIDA CONNECTOR FOR ATAC
Size B
Document Number
REMJEI32.SCH
REV 3.2
Date: September 17, 1997
Sheet 7 of 7

Part list for: TC ATAC, Main board

Mounted from S/N: 660131

PCB version: PC7001-3 | Schematic version: 3.2

Ref	No	Type	TCCode	Value/Name	Pos	Page	PCB	Comments
R	1	RESISTOR	151510011	10K		1	r0805	Encoder pull down.
R	2	RESISTOR	151510011	10K		1	r0805	Encoder pull down.
R	3	RESISTOR	151510011	10K		1	r0805	Encoder pull down.
R	4	RESISTOR	151510011	10K		1	r0805	Encoder pull down.
R	5	RESISTOR	151510011	10K		1	r0805	Encoder pull down.
R	6	RESISTOR	151510011	10K		1	r0805	Encoder pull down.
R	7	RESISTOR	151510011	10K		1	r0805	Encoder pull down.
R	8	RESISTOR	151510011	10K		1	r0805	Encoder pull down.
R	9	RESISTOR	151510011	10K		1	r0805	Encoder pull down.
R	10	RESISTOR	151510011	10K		1	r0805	Encoder pull down.
R	11	RESISTOR	151410011	1K		1	r0805	LED 1 pull up.
R	12	RESISTOR	151410011	1K		1	r0805	LED 3 pull up.
R	13	RESISTOR	151410011	1K		1	r0805	LED 2 pull up.
R	14	RESISTOR	151510011	10K		1	r0805	MODE pull down
R	15	RESISTOR	151510011	10K		1	r0805	BOOT pull down.
R	16	RESISTOR	151000011	0 E		1	r0805	AD-gnd.
R	17	RESISTOR	151000011	0 E		1	r0805	AD-vcc.
R	18	RESISTOR	151210011	10 E		1	r0805	AD-ref.
R	19	RESISTOR	151347011	470 E		2	r0805	LED 1 drive resistor.
R	20	RESISTOR	151347011	470 E		2	r0805	LED 2 drive resistor.
R	21	RESISTOR	151347011	470 E		2	r0805	LED 3 drive resistor.
R	22	RESISTOR	151347011	470 E		2	r0805	LED 4 drive resistor.
R	23	RESISTOR	151347011	470 E		2	r0805	LED 5 drive resistor.
R	24	RESISTOR	151347011	470 E		2	r0805	LED 6 drive resistor.
R	25	RESISTOR	151347011	470 E		2	r0805	LED 7 drive resistor.
R	26	RESISTOR	151347011	470 E		2	r0805	LED 8 drive resistor.
R	27	RESISTOR	151347011	470 E		2	r0805	LED 9 drive resistor.
R	28	RESISTOR	151347011	470 E		2	r0805	Column 1 drive.
R	29	RESISTOR	151347011	470 E		2	r0805	Column 2 drive.
R	30	RESISTOR	151347011	470 E		2	r0805	Column 3 drive.
R	31	RESISTOR	151347011	470 E		2	r0805	Column 4 drive.
R	32	RESISTOR	151347011	470 E		2	r0805	Column 5 drive.
R	33	RESISTOR	151510011	10K		2	r0805	Row 1 pull up.

R	34	RESISTOR	151510011	10K		2	r0805	Row 2 pull up.
R	35	RESISTOR	151510011	10K		2	r0805	Row 3 pull up.
R	36	RESISTOR	151510011	10K		2	r0805	Row 4 pull up.
R	37	RESISTOR	151510011	10K		2	r0805	Row 5 pull up.
R	38	RESISTOR	151510011	10K		2	r0805	Row 6 pull up.
R	39	RESISTOR	151510011	10K		2	r0805	Row 7 pull up.
R	40	RESISTOR	151510011	10K		2	r0805	Row 8 pull up.
R	41	RESISTOR	151322011	220 E		6	r0805	MIDI IN resistor.
R	42	RESISTOR	151322011	220 E		6	r0805	MIDI OUT pull up.
R	43	RESISTOR	151322011	220 E		6	r0805	MIDI OUT .
R	44	RESISTOR	151410011	1K		6	r0805	MODI OUT drive resistor.
R	45	RESISTOR	151310011	100 E		6	r0805	REMOTE out.
R	46	RESISTOR	151310011	100 E		6	r0805	REMOTE out pull up.
R	47	RESISTOR	151310011	100 E		6	r0805	REMOTE in pull up.
R	48	RESISTOR	151510011	10K		6	r0805	
R	49	RESISTOR	151410011	1K		6	r0805	Interface test relay .
R	50			not used				
R	51	RESISTOR	151410011	1K		6	r0805	
R	52	RESISTOR	151312011	120 E		6	r0805	RS-485 terminator.
R	53	RESISTOR	151447011	4K7		6	r0805	
R	54	RESISTOR	151510011	10K		6	r0805	Remote recieve pull up.
R	55	RESISTOR	151410011	1K		6	r0805	
R	56	RESISTOR	151510011	10K		6	r0805	
R	57	RESISTOR	151510011	10K		6	r0805	Midi recieve pull up.
R	58			not used				
R	59	RESISTOR	151510011	10K		7	r0805	Jeida RFSH* pull up.
R	60	RESISTOR	151510011	10K		7	r0805	Jeida WAIT* pull up.
R	61	RESISTOR	151510011	10K		7	r0805	Jeida JA21 pull down.
R	62	RESISTOR	151510011	10K		7	r0805	Jeida JA22 pull down.
R	63	RESISTOR	151510011	10K		7	r0805	Jeida JA23 pull down.
R	64	RESISTOR	151510011	10K		7	r0805	Jeida JA24 pull down.
R	65	RESISTOR	151510011	10K		7	r0805	Jeida JA25 pull down.
R	66	RESISTOR	151510011	10K		7	r0805	Jeida BVD2 pull up.
R	67	RESISTOR	151510011	10K		7	r0805	Jeida BVD1 pull up.
R	68	RESISTOR	151510011	10K		7	r0805	Jeida CD2* pull up.
R	69	RESISTOR	151510011	10K		7	r0805	Jeida CD1* pull up.
R	70	RESISTOR	151510011	10K		7	r0805	Jeida RDY/BSY* pull up.
R	71	RESISTOR	151510011	10K		7	r0805	Jeida
R	72	RESISTOR	151510011	10K		7	r0805	Jeida

R	73	RESISTOR	151610011	100K		7	r0805	Jeida RESET pull up.
R	74	RESISTOR	151410011	1K		7	r0805	
R	75	RESISTOR	151510011	10K		7	r0805	
R	76	RESISTOR	151510011	10K		7	r0805	Vpp +12 volt pull down.
R	77	RESISTOR	151410011	1K		7	r0805	
R	78	RESISTOR		33K2, 1%		7	r0805	With R79 AD vpp-pcmcia measure
R	79	RESISTOR		10K0, 1%		7	r0805	+12v = +4v on ad.
R	80	RESISTOR	151510011	10K		4	r0805	AD measure current backlight.
R	81	RESISTOR	151347011	470 E		4	r0805	Bias for Q9 and Q10.
R	82	RESISTOR	151410011	1K		4	r0805	Current CCFL. 1V=1ma.
R	83	RESISTOR		2K21, 1%		4	r0805	With R84 AD measure contrast.
R	84	RESISTOR		10K0, 1%		4	r0805	+4,1V=0V, +2,3=-10V
R	85	RESISTOR	151310011	100 E		4	r0805	
R	86	RESISTOR	151410011	1K		4	r0805	
R	87	RESISTOR	151510011	10K		4	r0805	With R88 and IC16, gain=3,3gg
R	88	RESISTOR	151533011	33K		4	r0805	
R	89	RESISTOR	151510011	10K		4	r0805	With R90 and IC17. -15V=-13,75V
R	90	RESISTOR	151410011	1K		4	r0805	
R	91	RESISTOR	151310011	100 E		4	r0805	IC17 current limit.
R	92	RESISTOR	151000011	0 E		4	r0805	Display Font Size = gnd = 8x8.
R	93			not used				
R	94	RESISTOR	151510011	10K		1	r0805	Chip Select 7 pull up.
R	95	RESISTOR		10K0, 1%		4	r0805	+1,6volt = -13,75 volt
R	96			not used				
R	97			not used				
R	98	RESISTOR		10K0, 1%		5	r0805	With R99 AD measure battery.
R	99	RESISTOR		10K0, 1%		5	r0805	+1,5 volt = +3 volt.
R	100	RESISTOR		10K0, 1%		5	r0805	With R101 AD measure input V.
R	101	RESISTOR		1K00, 1%		5	r0805	+1,36 volt = +15 volt.
R	102	RESISTOR	151410011	1K		5	r0805	With R103/Q13 measure battery.
R	103	RESISTOR	151510011	10K		5	r0805	
R	104	RESISTOR	151510011	10K		5	r0805	Battery current limit.
R	105	RESISTOR		10K0, 1%		5	r0805	With R106 measure remote supply
R	106	RESISTOR		1K00, 1%		5	r0805	+1,36 volt = +15 volt.
R	107	RESISTOR	151000011	0 E		5	r0805	Watch dog. Open = disabled.
R	108	RESISTOR	151427011	2K7		5	r0805	
R	109	RESISTOR		2K10, 1%		5	r0805	With R109/IC18 = +5volt.
R	110	RESISTOR		2K74, 1%		5	r0805	
R	111	RESISTOR	151310011	100 E		5	r0805	AD measure +5 volt supply by checking R109 and R110.
R	112	RESISTOR		not used		1	r0805	Chip Select 0 pull up.

R	113	RESISTOR	151510011	10K		1	r0805	
R	114	RESISTOR	151510011	10K		1	r0805	Chip Select 2 pull up.
R	115	RESISTOR	151510011	10K		1	r0805	Chip Select 3 pull up.
R	116	RESISTOR	151510011	10K		1	r0805	Chip Select 4 pull up.
R	117	RESISTOR	151510011	10K		1	r0805	Chip Select 5 pull up.
R	118	RESISTOR	151510011	10K		1	r0805	Chip Select 6 pull up.
R	119	RESISTOR		2K21, 1%		4	r0805	With R95 AD measure -15 volt.
R	120			not used			r0805	
R	121	RESISTOR	151510011	10K		3	r0805	SRAM pull up.
R	122	RESISTOR	151410011	1K		5	r0805	RESET* pull up.
R	123	RESISTOR		If IC6=DS36276=10K else open		6	r0805	IF DS36276
R	124	RESISTOR	151410011	1K		6	r0805	
R	125			not used				
R	126	RESISTOR		If IC6=DS36277=10K else open		6	r0805	IF DS36277
R	127	RESISTOR	151510011	10K		3	r0805	
R	128	RESISTOR	151510011	10K		3	r0805	
R	129	RESISTOR	151410011	1K		3	r0805	
R	130	RESISTOR		IF flash +5v=not used else 1K		1	r0805	IF 12volt flash
R	131	RESISTOR		IF flash +5v=1K else not used		1	r0805	
R	132	RESISTOR		IF flash +5v=not used else 0E		3	r0805	IF 12volt flash
R	133	RESISTOR		IF flash +5v=0E else not used		3	r0805	
D	1	DIODE	360001011	LL4148, Alt: BAS-32		6	SOD80	midi-in protection
D	2	DIODE	360001011	LL4148, Alt: BAS-32		6	SOD80	Q4 protection
D	3	DIODE	360002011	LL5818		7	SOD87	+12volt SWPS for pcmcia
D	4	DIODE	360001011	LL4148, Alt: BAS-32		7	SOD80	Jeida BOOT.
D	5	DIODE	360001011	LL4148, Alt: BAS-32		7	SOD80	Jeida RESET.
D	6	DIODE	360002011	LL5818		4	SOD87	Royer sw ps.
D	7	DIODE	360002011	LL5818		4	SOD87	-15 volt SWPS for display.
D	8	DIODE	360001011	LL4148, Alt: BAS-32		4	SOD80	
D	9	DIODE	360001011	LL4148, Alt: BAS-32		4	SOD80	
D	10	DIODE	360002011	LL5818		5	SOD87	Input supply polarity protection
D	11	DIODE	360002011	LL5818		5	SOD87	+5 volt swps diode
D	12	DIODE	360001011	LL4148, Alt: BAS-32		4	SOD80	Clamp C46 PWM
D	13	DIODE		not used		6	SOD87	Power TO remote conn. for test (LL5818)
LD	1	LED	317031012	Ø3 RED		1	leaded	test led
LD	2	LED	317031012	Ø3 RED		1	leaded	test led
LD	3	LED	317031012	Ø3 RED		1	leaded	test led

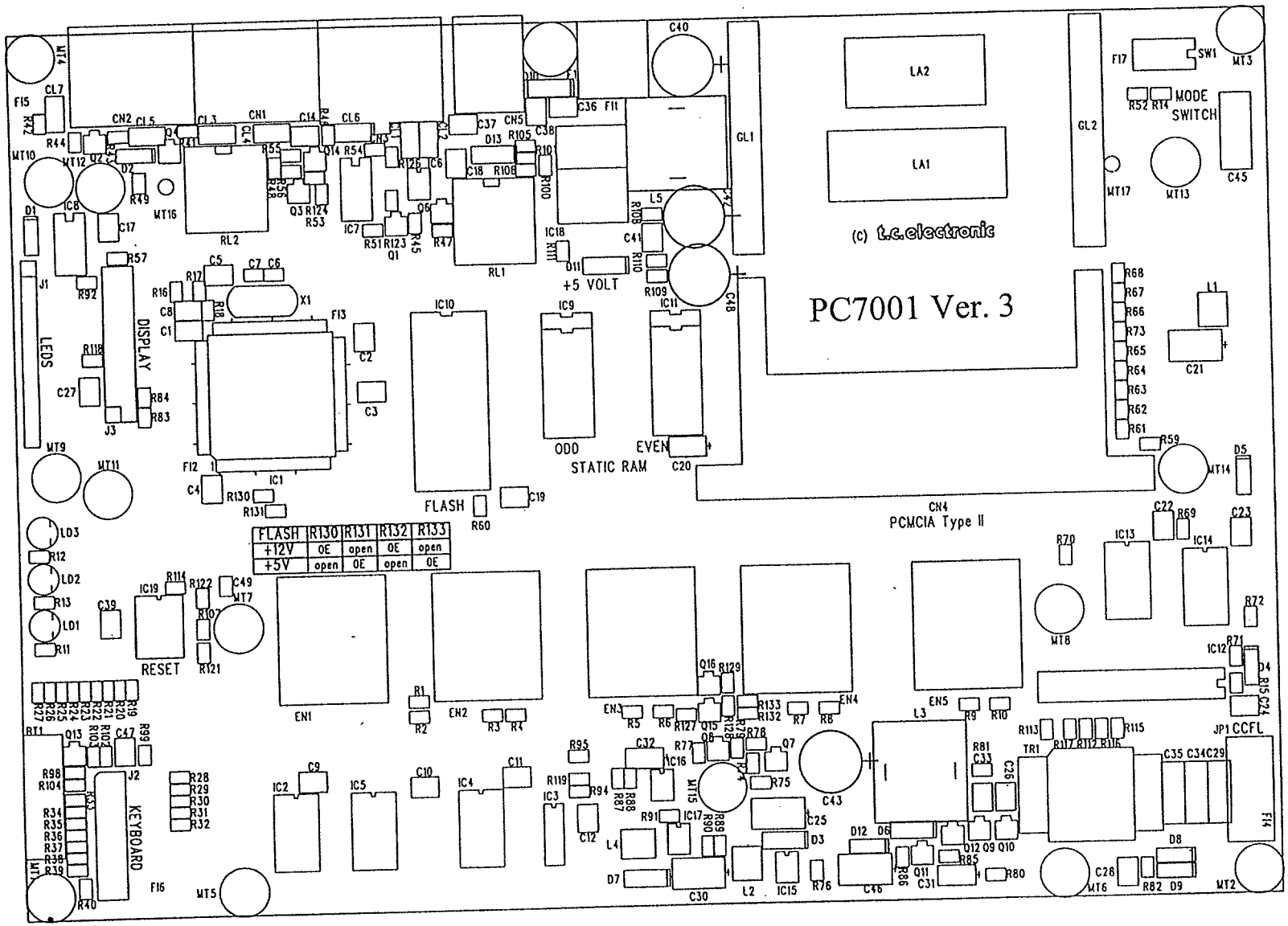
All bipolar capacitors are X7R except other specified							c1210 houses could be 1206 too	
C	1	CAPACITOR	257610011	100nF		1	c1210	AD decoupling REF.
C	2	CAPACITOR	257610011	100nF		1	c1210	+5 volt decoupling.
C	3	CAPACITOR	257610011	100nF		1	c1210	+5 volt decoupling.
C	4	CAPACITOR	257610011	100nF		1	c1210	+5 volt decoupling.
C	5	CAPACITOR	257610011	100nF		1	c1210	+5 volt decoupling.
C	6	CAPACITOR	251210011	10pF, NP0		1	c0805	Xtal capasitors.
C	7	CAPACITOR	251210011	10pF, NP0		1	c0805	Xtal capasitors.
C	8	CAPACITOR	257610011	100nF		1	c1210	AD decoupling vcc and gnd
C	9	CAPACITOR	257610011	100nF		2	c1210	+5 volt decoupling.
C	10	CAPACITOR	257610011	100nF		2	c1210	+5 volt decoupling.
C	11	CAPACITOR	257610011	100nF		2	c1210	+5 volt decoupling.
C	12	CAPACITOR	257610011	100nF		2	c1210	+5 volt decoupling.
C	13			not used				
C	14	CAPACITOR	257610011	100nF		6	c1210	+5 volt decoupling.
C	15			not used				
C	16			not used				
C	17	CAPACITOR	257610011	100nF		6	c1210	+5 volt decoupling.
C	18	CAPACITOR	257610011	100nF		6	c1210	+5 volt decoupling.
C	19	CAPACITOR	257610011	100nF		3	c1210	+5 volt decoupling.
C	20	CAPACITOR	260110021	1uF/16V		3	TANTAL\B	Decoupling SRAM vcc.
C	21	CAPACITOR	260222031	22uF/20V		7	TANTAL\D	Decoupling vcc to jeida.
C	22	CAPACITOR	257610011	100nF		7	c1210	+5 volt decoupling.
C	23	CAPACITOR	257610011	100nF		7	c1210	+5 volt decoupling.
C	24	CAPACITOR	257610011	100nF		7	c1210	+5 volt decoupling.
C	25	CAPACITOR	260222031	22uF/20V		7	TANTAL\D	Jeida +5/+12 volt vpp decoupling
C	26	CAPACITOR	257610011	100nF		4	c1210	Capacitor for resonans in royer.
C	27	CAPACITOR	257610011	100nF		4	c1210	+5 volt decoupling display.
C	28	CAPACITOR	257610011	100nF		4	c1210	+5 volt decoupling.
C	29	CERAMIC	204227011	Murata DE0607 27pF/3.51kV		4	CAP\3M	for CFL backlight. Alt.: TDK CC45SL3FD270KYPN
C	30	CAPACITOR	260222031	22uF/20V		4	TANTAL\D	-15 volt
C	31	CAPACITOR	260110021	1uF/16V		4	TANTAL\B	Decoupling CCFL current feedback
C	32	CAPACITOR	260110021	1uF/16V		4	TANTAL\B	Integrate pwm from H8.
C	33	CAPACITOR	257610011	100nF		4	c1210	Capacitor for resonans in royer.
C	34	CERAMIC	204227011	Murata DE0607 27pF/3.51kV		4	CAP\3M	for CFL backlight. Alt.: TDK CC45SL3FD270KYPN
C	35	CERAMIC	204227011	Murata DE0607 27pF/3.51kV		4	CAP\3M	for CFL backlight. Alt.: TDK CC45SL3FD270KYPN
C	36	CAPACITOR	257610011	100nF		5	c1210	Input supply EMC protection.
C	37	CAPACITOR	257610011	100nF		5	c1210	Input supply EMC protection.
C	38	CAPACITOR	257610011	100nF		5	c1210	Input supply EMC protection.

C	39	CAPACITOR	257610011	100nF		5	c1210	+5 volt decoupling, reset.
C	40	LYT	223322042	220uF/35V.		5	LYT\2M	Input capacitor. Max h=20mm, d=10.mm
C	41	CAPACITOR	257510011	10nF		5	c1210	+5 volt decoupling.
C	42	LYT	220347012	47uF/6v, OS-CON organic		5	LYT\2M	Organic (6x6,5mm). Alt: Sanyo 6SA47M , Marcon CACFM0A470M
C	43	LYT	220322012	220uF/10v, OS-CON organic		5	LYT\2M	Organic (10x10,5mm). Alt : Sanyo 10SA220M,K , Marcon CACFM1A221M
C	44			not used				
C	45	MTL	201710012	1uF/100V multilayer		5	CAP\2-4M	DGND afkobling til chassis
C	46	TANTAL	260222031	22uF/20V		4	TANTAL\D	Protect CCFL for overload
C	47	CAPACITOR	257610011	100nF		5	c1210	Protect battery
C	48	LYT	220347012	47uF/6v, OS-CON organic		5	LYT\2M	Organic (6x6,5mm)
C	49			not used		5	c0805	RESET* decoupling
Q	1	TRANSISTOR	351001011	BC857, pnp		6	SOT-23	Remote
Q	2	TRANSISTOR	351001011	BC857, pnp		6	SOT-23	midi,TXD
Q	3	TRANSISTOR	351000011	BC847, npn		6	SOT-23	
Q	4	TRANSISTOR	351001011	BC857, pnp		6	SOT-23	Midi test relay driver.
Q	6	TRANSISTOR	351000011	BC847, npn		6	SOT-23	
Q	7	TRANSISTOR	351003011	FMMT720 Zetex, pnp		7	SOT-23	Jeida VPP switch, +5/12 volt
Q	8	TRANSISTOR	351000011	BC847, npn		7	SOT-23	Driver for VPP switch
Q	9	TRANSISTOR	351002011	FMMT619 Zetex, npn		4	SOT-23	Royer light control.
Q	10	TRANSISTOR	351002011	FMMT619 Zetex, npn		4	SOT-23	Royer light control.
Q	11	TRANSISTOR	351000011	BC847, npn		4	SOT-23	Driver for royer switch
Q	12	TRANSISTOR	351003011	FMMT720 Zetex, pnp		4	SOT-23	Royer supply switch
Q	13	TRANSISTOR	351000011	BC847, npn		5	SOT-23	Battery measure switch
Q	14	TRANSISTOR	351001011	BC857, pnp		6	SOT-23	Remote TxD
Q	15	TRANSISTOR	351000011	BC847, npn		3	SOT-23	
Q	16	TRANSISTOR	351000011	BC847, npn		3	SOT-23	
L	1	COIL	502004011	47uH/150mA : LQH3C470K04		7		Jeida EMC.
L	2	COIL	502004011	47uH/150mA : LQH3C470K04		7		+12 volt coil
L	3	COIL	502005011	58uH/1,2A, PULSE PE-53604		4		Royer supply (Layout for 3 coils). Alt.: Coiltronics CTX 50 - 4P, NEOSID Sd8-serie. 47uH, pn.: 00 6021 05
L	4	COIL	502004011	47uH/150mA : LQH3C470K04		4		-15 volt coil
L	5	COIL	502005011	58uH/1,2A, PULSE PE-53604		5		Input switch coil. Alt.: Coiltronics CTX 50 - 4P, NEOSID Sd8-serie. 47uH, pn.: 00 6021 05

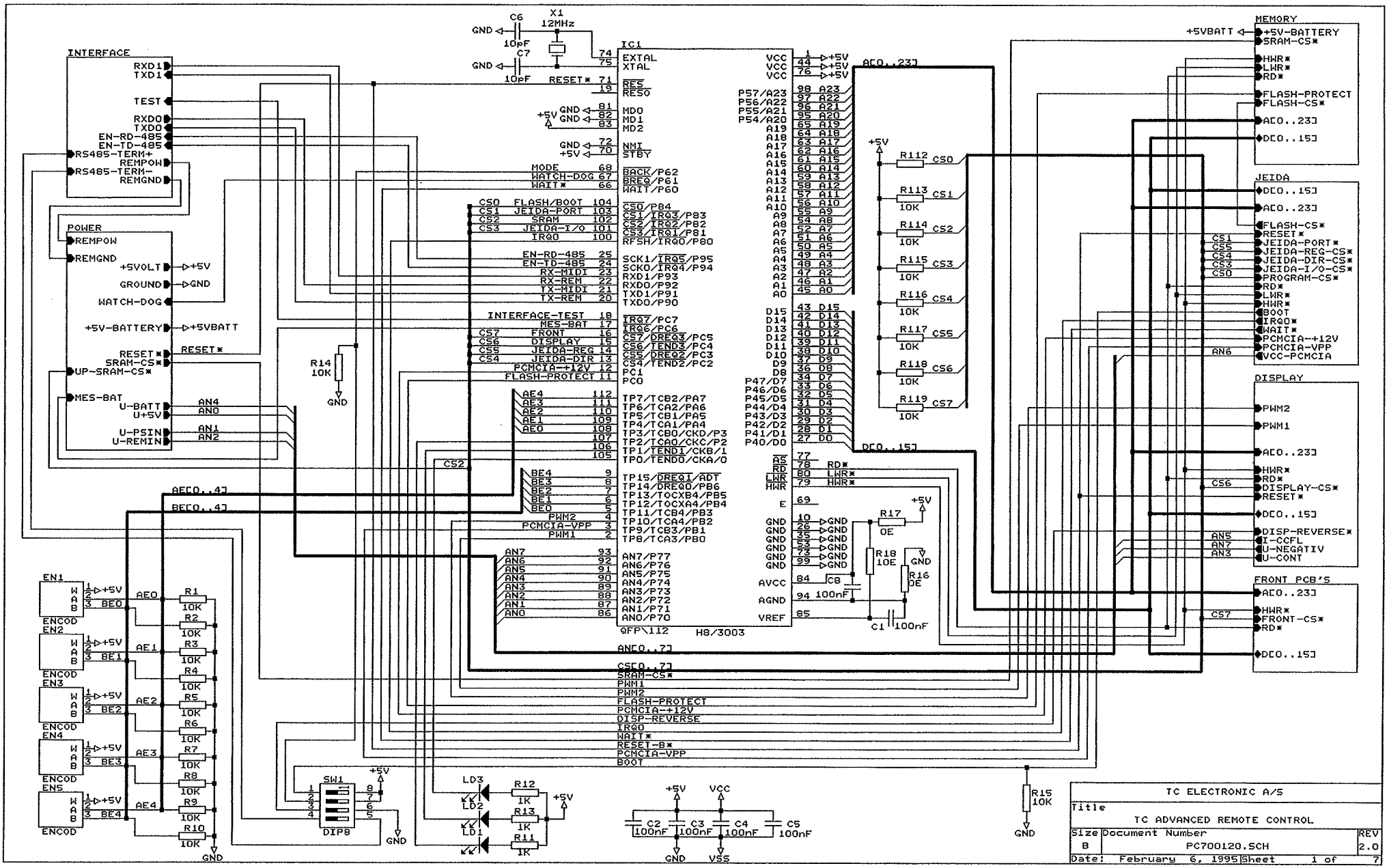
IC	1	CPU	490004011	HD6413003TF 16MHz H8		1	QFP\112	(T-version) CPU 1:1 type. Running 12 MHz.
IC	2	HCMOS		74HCT541		2	DIP20\sol	Read keyboard.
IC	3	HCMOS	455013911	74HC139		2	DIP16\so	CS for led and keyboard.
IC	4	HCMOS	455057411	74HC574		2	DIP20\sol	led driver.
IC	5	HCMOS	455057411	74HC574		2	DIP20\sol	led driver/key scan matrix
IC	6	DRIVER	491004011	DS36277		6	DIP8\so	RS485 driver with FAILSAFE. (Alt: DS36276)
IC	7	OPTO	346006011	6N137		6	DIP8	Remote recieve opto.
IC	8	OPTO	346006011	6N137		6	DIP8	Midi recieve opto.
IC	9	SRAM	481001011	62256, 8x32Kb, <120ns		3	DIP28\sol	SRAM odd. Layout for 628128, 128k*8, <120nS, 32pSO
IC	10	FLASH	484001011	Intel PA28F400BV-B120		3	DIP44\PSO	FLASH 512KByte <120ns, 5volt boo, Buttom boot, 16bit, 5volt, AMD Am29F400B-120SC
				+12volt alternatives. (It include changes on R130, R131, R132, R133) INTEL : PA28F400BX-B80t, PA928F400BX-B60				
IC	11	SRAM	481001011	62256, 8x32Kb, <120ns		3	DIP28\sol	SRAM even. Layout for 628128, 128k*8, <120nS, 32pSO
IC	12	PAL	434026011	22CV10-25		7	DIP24\300	Name : ATACP1-2
IC	13	HCMOS		74HCT541		7	DIP20\sol	PCMCIA status latch. (read)
IC	14	HCMOS	455057411	74HC574		7	DIP20\sol	PCMCIA (write)
IC	15	LINEAR	491005011	LT1109CS8-12		7	DIP8\so	+12 volt pcmcia vpp, max50mA
IC	16	LINEAR	470010011	LM358M(AM)		4	DIP8\so	Contrast driver.
IC	17	LINEAR	491006011	LT1111CS8		4	DIP8\so	-15 volt buchboost dc-dc conv.
IC	18	LINEAR	491007011	LT10+E24776CQ , smd+E257		5	smd	+5 volt buch 100Khz dc-dc conv. LT1076CT-#06, Alt.: LT1074 , MAX726/MAX724.
IC	19	LINEAR	491003011	LTC693CS, wide body		5	DIP16\SOL	Power monitor/Reset circuit. Alt.: Analog Device ADM693AR
X	1	CRYSTAL	331006011	12 MHz, HC49		1		H8-xtal. MPU-version 1:1, (small type < 5mm)
CL	1	FILTER	504000011	Murata NFM41R00C221		6		220pF
CL	2	FILTER	504000011	Murata NFM41R00C221		6		220pF
CL	3	FILTER	504000011	Murata NFM41R00C221		6		220pF
CL	4	FILTER	504000011	Murata NFM41R00C221		6		220pF
CL	5	FILTER	504000011	Murata NFM41R00C221		6		220pF
CL	6	FILTER	504000011	Murata NFM41R00C221		6		220pF
CL	7	FILTER	504000011	Murata NFM41R00C221		6		220pF
TR	1	TRAFO	510027011	Coiltronic CTX110654		4		Royer CCFL transformer. alt: CTX210655, CTX110092, CTX110651, CTX210653
FI	1	FILTER	504001011	Murata: BNP002-02		5		EMC filter for input spuuly.
F	1	FUSE	343020011	1AT, Wickmann TR5-T No 1937		5		Fuse on input voltage. Alt.: Schurter 0034.6615 MST
RL	1	RELAY	555000011	Takamisawa AS-5W-K		6		Remote test relay. Alt.: NEC EB2-5
RL	2	RELAY	555000011	Takamisawa AS-5W-K		6		Midi test relay. Alt.: NEC EB2-5

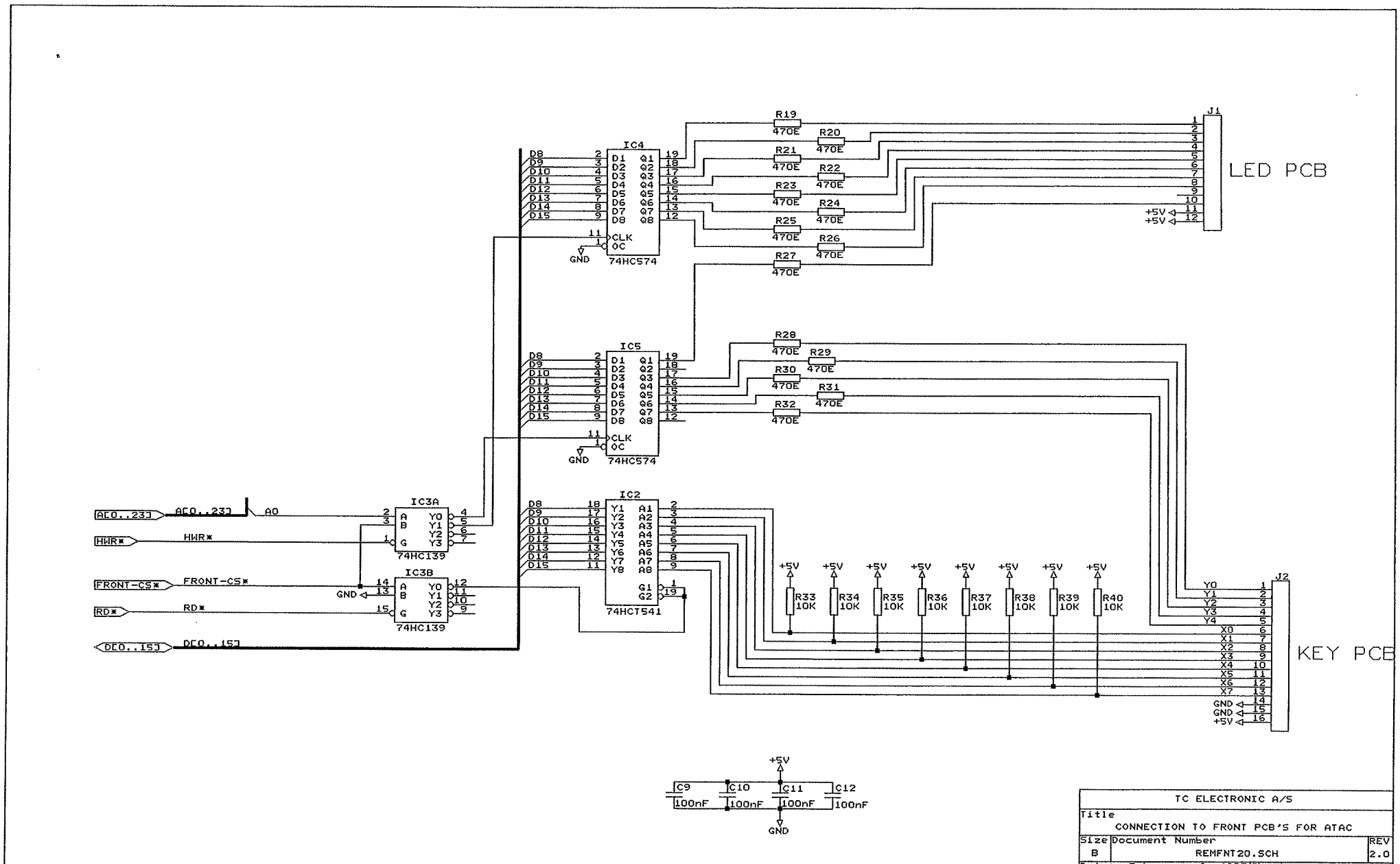
SW	1	SWITCH	340008011	DIP sw 4-pol with sw on side.	1		BOOT=1, MODE=1
J	1	HEADER	526001214	1x12 pin /	2		led pcb connector
J	2	HEADER	525022011	2x8 pin / 8-10mm	2		key pcb connector
J	3	HEADER	525023011	2x10 pin / 12-14mm	4		lcd display conn
JP	1	JUMPER		2 pin. 12mm between holes	4		CCFL backlight connector
EN	1	ENCODER	340001011	DP18A24C20 6mm Meggit	1	ENCOD	Encoder A
EN	2	ENCODER	340001011	DP18A24C20 6mm Meggit	1	ENCOD	Encoder B
EN	3	ENCODER	340001011	DP18A24C20 6mm Meggit	1	ENCOD	Encoder C
EN	4	ENCODER	340001011	DP18A24C20 6mm Meggit	1	ENCOD	Encoder D
EN	5	ENCODER	340001011	DP18A24C20 6mm Meggit	1	ENCOD	Encoder Program
CN	1	CONNECTOR	522010011	5 pole DIN Female PCB	6		MIDI IN.
CN	2	CONNECTOR	522010011	5 pole DIN Female PCB	6		MIDI OUT.
CN	3	CONNECTOR	522013011	7 pole DIN Female PCB	6		REMOTE.
CN	4	CONNECTOR	523001011	68 pole jeida connector	7		PCMCIA
CN	5	CONNECTOR	523003011	DC plug. 2mm.	5		DC input.
BT	1	BATTERY	342000011	CR2032	5		Lithium Battery
Accessories for PC7001-3 :							
IC	12	SOCKET	449006011	24 pol socket, 300 mil.			Socket for PEEL.

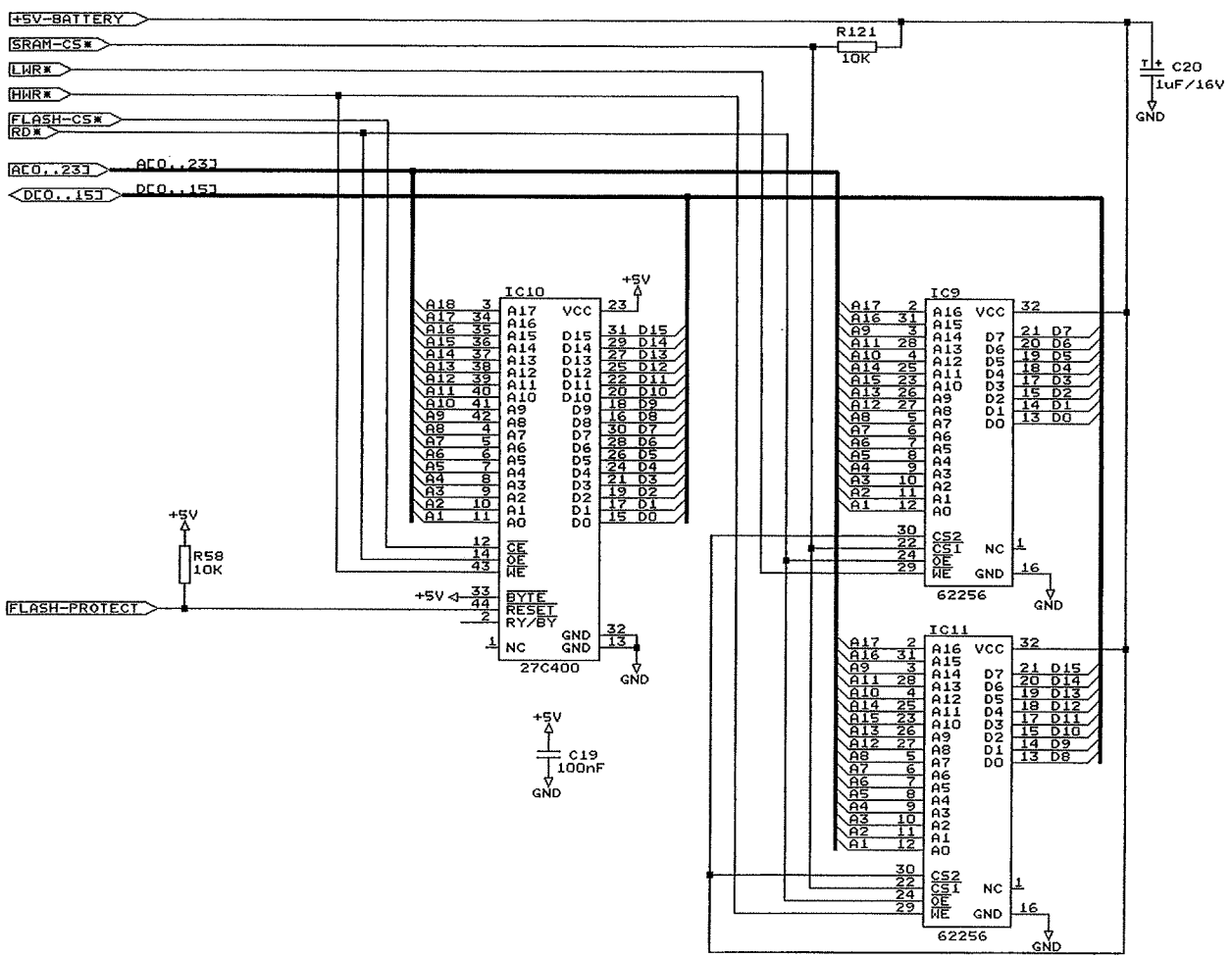
Removed components from version 2 to version 3 :								
R	58			10K				
NEW components from version 2 to version 3 :								
R	126	MODST		If IC6=DS36277=10K else open			r0805	
R	127	MODST		10K			r0805	
R	128	MODST		10K			r0805	
R	129	MODST		1K			r0805	
R	130	MODST		IF flash +5v=not used else 1K			r0805	
R	131	MODST		IF flash +5v=1K else not used			r0805	
R	132	MODST		IF flash +5v=not used else 0E			r0805	
R	133	MODST		IF flash +5v=0E else not used			r0805	
Q	15	TRANS		BC847, npn			SOT-23	
Q	16	TRANS		BC847, npn			SOT-23	
Changed components from version 2 to version 3 :								
		from :		**to:**				
Q	14	BC847		BC857				
R	45	220E		100E				
R	46	220E		100E				
R	51	10K		1K				
R	122	10K		1K				
R	124	4K7		1K				
Changed components from version 3.0 to version 3.1 :								
		from :		**to:**				
R	119	10K, 5%		2K21, 1%				
R	94	2K21, 1%		10K, 5%				
Removed components from version 3.0 to version 3.1 :								
D	13	DIODE		LL5818			SOD87	Power TO remote conn. for test
There is no changes from version 3.1 to 3.2 except for additional service comments								



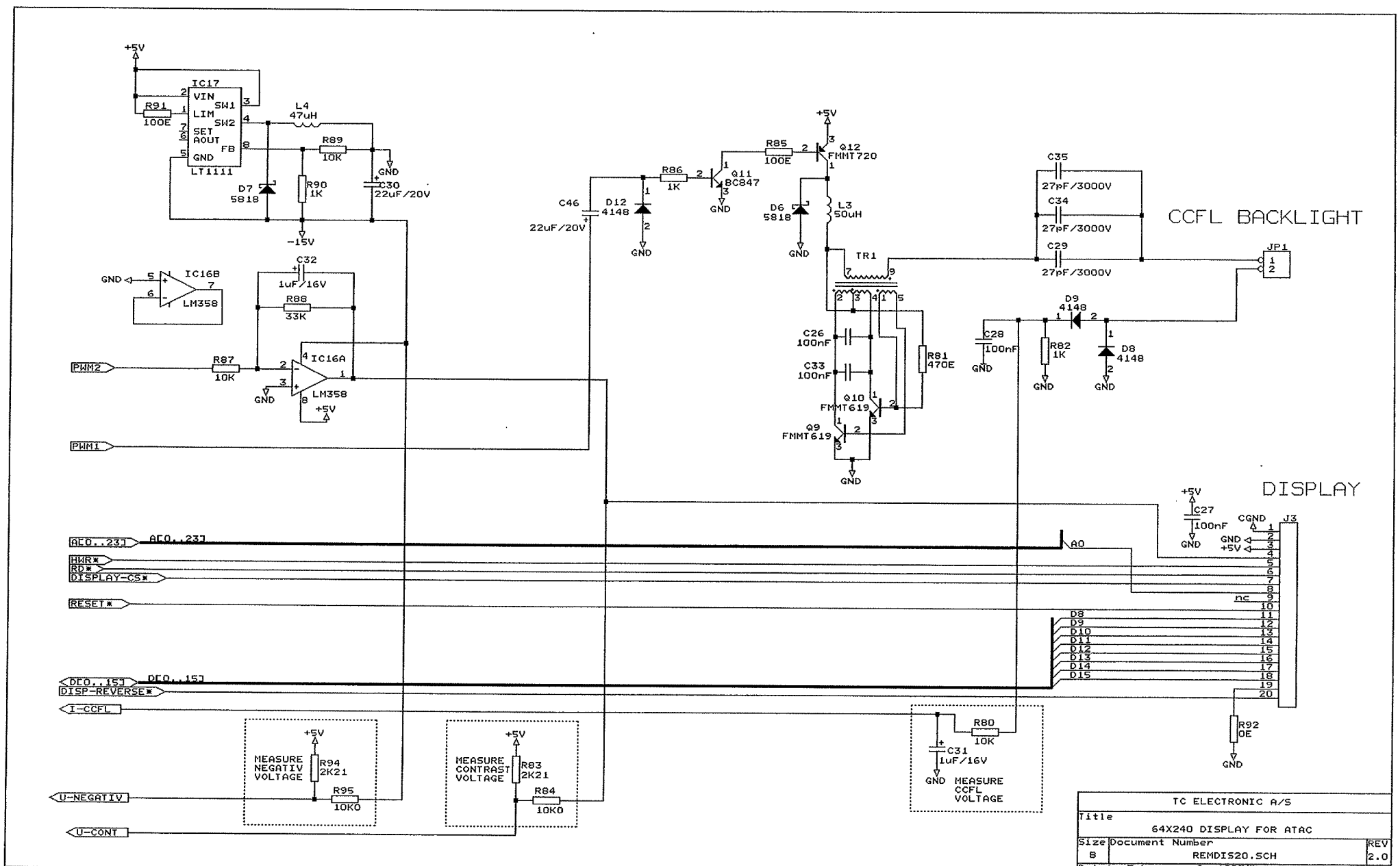
PCB Lay-out for version PC7001-3

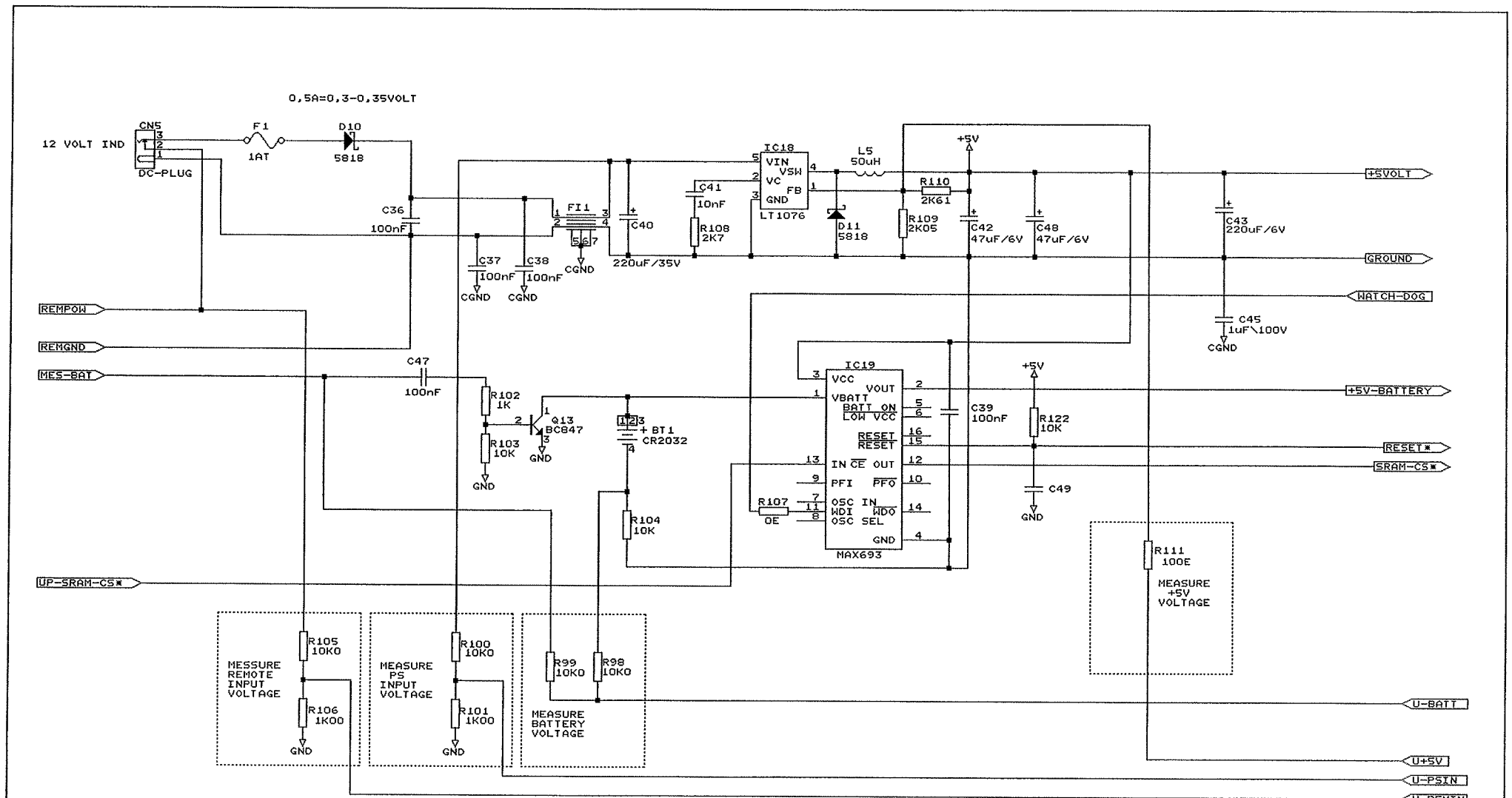

INTERFACE
RXD1
TXD1
TEST
RXD0
TXD0
EN-RD-485
EN-TD-485
RS485-TERM+
REMPOW
RS485-TERM-
REMGND
POWER
REMPOW
REMGND
+5VOLT
GROUND
WATCH-DOG
+5V-BATTERY
RESET*
SRAM-CS*
UP-SRAM-CS*
MES-BAT
U-BATT
U+5V
U-PSIN
U-REMIN
C6
10pF
X1
12MHz
C7
10pF
RESET*
IC1
EXTAL
XTAL
RES
RESO
MD0
MD1
MD2
NMI
STBY
MODE
WATCH-DOG
WAIT*
BACK/P62
BREQ/P61
WAIT/P60
CS0 FLASH/BOOT
CS1 JEIDA-PORT
CS2 SRAM
CS3 JEIDA-I/O
IRQ0
EN-RD-485
EN-TD-485
RX-MIDI
RX-REM
TX-MIDI
TX-REM
INTERFACE-TEST
MES-BAT
CS7 FRONT
CS6 DISPLAY
CS5 JEIDA-REG
CS4 JEIDA-DIR
PCMCIA-+12V
FLASH-PROTECT
IRQ7/PC7
IRQ6/PC6
CS7/DREQ3/PC5
CS6/TEND3/PC4
CS5/DREQ2/PC3
CS4/TEND2/PC2
PC1
PC0
TP7/TCB2/PA7
TP6/TCA2/PA6
TP5/TCB1/PA5
TP4/TCA1/PA4
TP3/TCB0/CKD/P3
TP2/TCA0/CKC/P2
TP1/TEND1/CKB/1
TP0/TEND0/CKA/0
TP15/DREQ1/ADT
TP14/DREQ0/PB6
TP13/TOCXB4/PB5
TP12/TOCXA4/PB4
TP11/TCB4/PB3
TP10/TCA4/PB2
TP9/TCB3/PB1
TP8/TCA3/PB0
PWM2
PCMCIA-VPP
PWM1
AN7/P77
AN6/P76
AN5/P75
AN4/P74
AN3/P73
AN2/P72
AN1/P71
AN0/P70
QFP\112
H8/3003
VCC
VCC
VCC
P57/A23
P56/A22
P55/A21
P54/A20
A19
A18
A17
A16
A15
A14
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
D15
D14
D13
D12
D11
D10
D9
D8
P47/D7
P46/D6
P45/D5
P44/D4
P43/D3
P42/D2
P41/D1
P40/D0
AS
RD
LWR
HWR
E
GND
GND
GND
GND
GND
GND
AVCC
AGND
VREF
A[0..23]
D[0..15]
R112 CS0
R113 CS1 10K
R114 CS2 10K
R115 CS3 10K
R116 CS4 10K
R117 CS5 10K
R118 CS6 10K
R119 CS7 10K
R17 0E
R18 10E
R16 0E
C8 100nF
C1 100nF
RD*
LWR*
HWR*
R14 10K
AN4
AN0
AN1
AN2
A[E0..4]
B[E0..4]
CS2
BE4
BE3
BE2
BE1
BE0
AN7
AN6
AN5
AN4
AN3
AN2
AN1
AN0
EN1
ENCOD
EN2
ENCOD
EN3
ENCOD
EN4
ENCOD
EN5
ENCOD
AE0
AE1
AE2
AE3
AE4
R1 10K
R2 10K
R3 10K
R4 10K
R5 10K
R6 10K
R7 10K
R8 10K
R9 10K
R10 10K
SW1
DIP8
LD3
LD2
LD1
R12 1K
R13 1K
R11 1K
C2 100nF
C3 100nF
C4 100nF
C5 100nF
R15 10K
A[0..7]
CS[0..7]
SRAM-CS*
PWM1
PWM2
FLASH-PROTECT
PCMCIA-+12V
DISP-REVERSE
IRQ0
WAIT*
RESET-B*
PCMCIA-VPP
BOOT
MEMORY
+5VBATT
+5V-BATTERY
SRAM-CS*
HWR*
LWR*
RD*
FLASH-PROTECT
FLASH-CS*
A[0..23]
D[0..15]
JEIDA
D[0..15]
A[0..23]
FLASH-CS*
RESET*
JEIDA-PORT*
JEIDA-REG-CS*
JEIDA-DIR-CS*
JEIDA-I/O-CS*
PROGRAM-CS*
RD*
LWR*
HWR*
BOOT
IRQ0*
WAIT*
PCMCIA-+12V
PCMCIA-VPP
VCC-PCMCIA
DISPLAY
PWM2
PWM1
A[0..23]
HWR*
RD*
DISPLAY-CS*
RESET*
D[0..15]
DISP-REVERSE*
I-CCFL
U-NEGATIV
U-CONT
FRONT PCB'S
A[0..23]
HWR*
FRONT-CS*
RD*
D[0..15]
TC ELECTRONIC A/S
Title
TC ADVANCED REMOTE CONTROL
Size B
Document Number PC700120.SCH
REV 2.0
Date: February 6, 1995
Sheet 1 of 7


IC4
74HC574
IC5
74HC574
IC2
74HCT541
IC3A
74HC139
IC3B
74HC139
R19
R20
R21
R22
R23
R24
R25
R26
R27
R28
R29
R30
R31
R32
470E
R33
R34
R35
R36
R37
R38
R39
R40
10K
J1
LED PCB
J2
KEY PCB
+5V
GND
A0..23
D0..15
HWR*
FRONT-CS*
RD*
C9
C10
C11
C12
100nF
TC ELECTRONIC A/S
CONNECTION TO FRONT PCB'S FOR ATAC
Size B
Document Number REMFNT20.SCH
REV 2.0
Date: February 6, 1995
Sheet 2 of 7

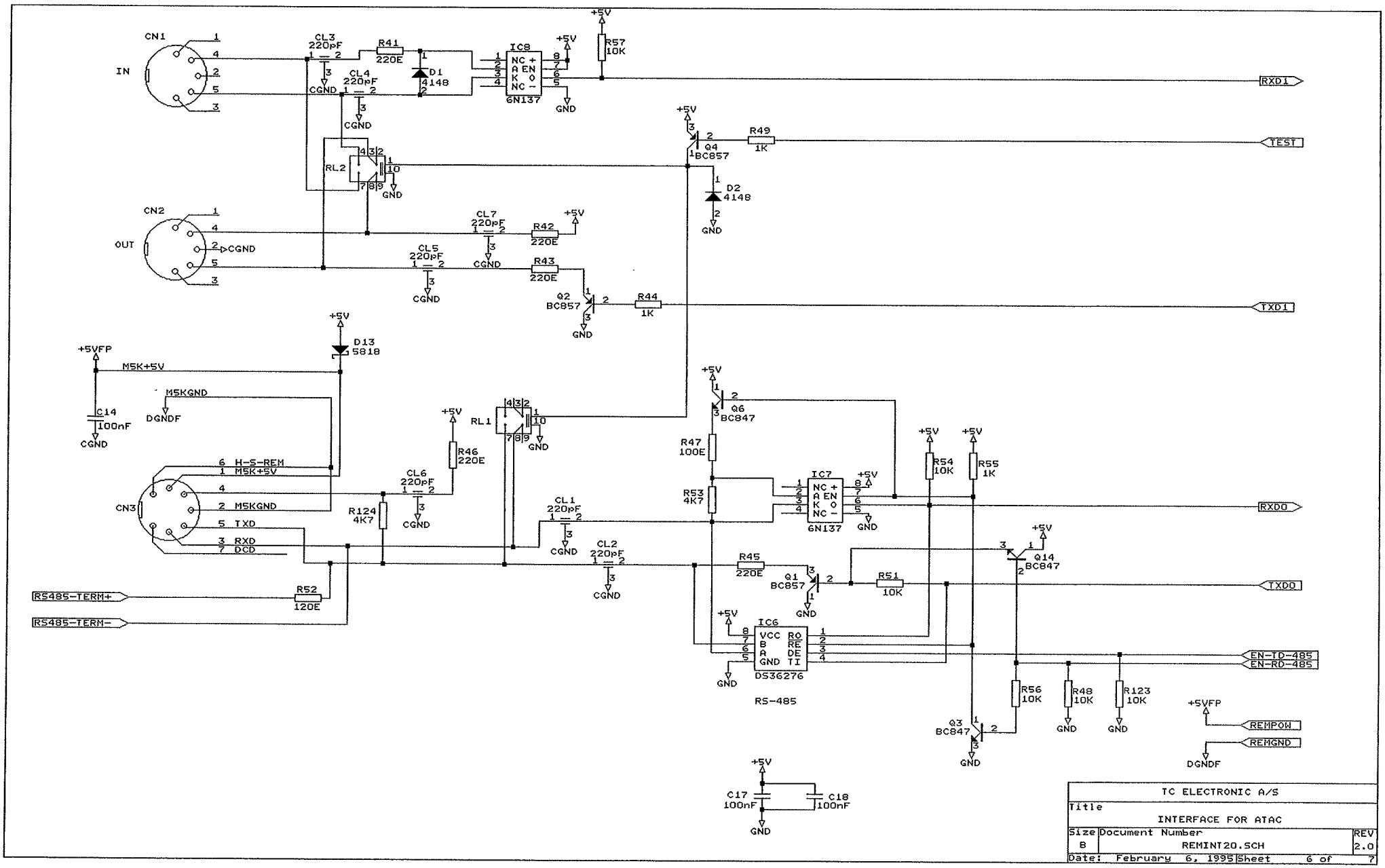


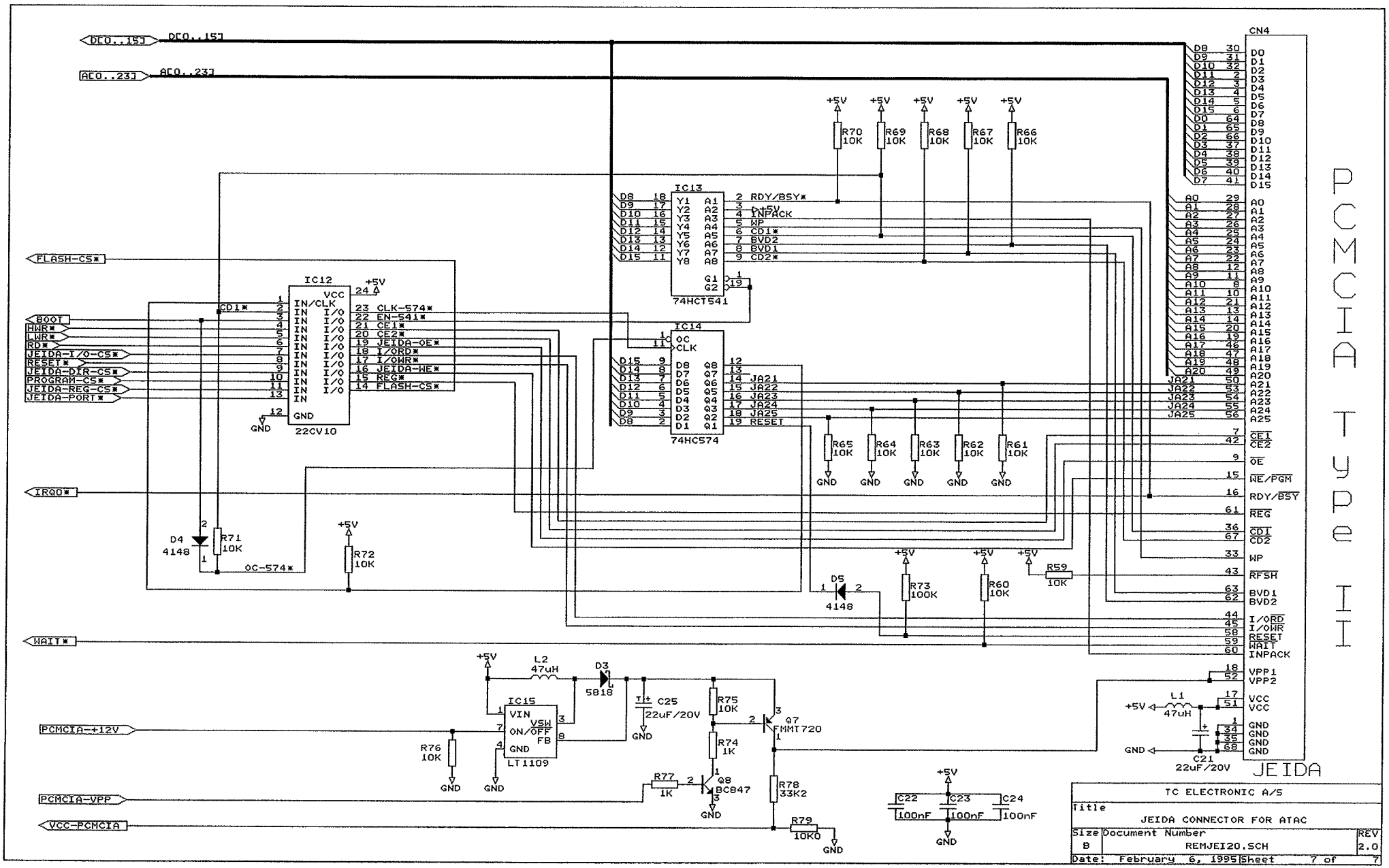
TC ELECTRONIC A/S		
Title: MEMORY FOR ATAC		
Size: B	Document Number: REMMEM20.SCH	REV: 2.0
Date: February 6, 1995	Sheet 3 of 7	


CCFL BACKLIGHT
DISPLAY
IC17
LT1111
IC16B
LM358
IC16A
LM358
Q12 FMMT720
Q11 BC847
Q10 FMMT619
Q9 FMMT619
TR1
JP1
J3
MEASURE NEGATIV VOLTAGE
MEASURE CONTRAST VOLTAGE
MEASURE CCFL VOLTAGE
PWM2
PWM1
HWR*
RD*
DISPLAY-CS*
RESET*
DISP-REVERSE*
I-CCFL
U-NEGATIV
U-CONT
TC ELECTRONIC A/S
Title
64X240 DISPLAY FOR ATAC
Size B
Document Number REMDIS20.SCH
REV 2.0
Date: February 6, 1995
Sheet 4 of 7



TC ELECTRONIC A/S		
Title: POWER SUPPLY FOR ATAC		
Size: B	Document Number: REMPOW20.SCH	REV: 2.0
Date: February 6, 1995	Sheet 5 of 7	


CN1
IN
CL3 220pF
R41 220E
CL4 220pF
CGND
D1 4148
IC8
NC + A EN K O NC -
6N137
+5V
R57 10K
GND
RXD1
RL2
R49 1K
Q4 BC857
TEST
D2 4148
CN2
OUT
CL7 220pF
R42 220E
CL5 220pF
R43 220E
Q2 BC857
R44 1K
TXD1
D13 5818
+5VFP
M5K+5V
M5KGND
DGNDF
C14 100nF
RL1
Q6 BC847
R47 100E
R53 4K7
R46 220E
CL6 220pF
R124 4K7
CN3
6 H-S-REM
1 M5K+5V
2 M5KGND
5 TXD
3 RXD
7 DCD
CL1 220pF
CL2 220pF
IC7
6N137
R54 10K
R55 1K
RXD0
R45 220E
Q1 BC857
R51 10K
Q14 BC847
TXD0
RS485-TERM+
RS485-TERM-
R52 120E
IC6
VCC B A GND RO RE DE DI
DS36276
RS-485
EN-TD-485
EN-RD-485
R56 10K
R48 10K
R123 10K
Q3 BC847
REMPOW
REMGND
C17 100nF
C18 100nF
TC ELECTRONIC A/S
Title
INTERFACE FOR ATAC
Size B
Document Number REMINT20.SCH
REV 2.0
Date: February 6, 1995
Sheet 6 of 7


PCMCIA Type II
JEIDA
CN4
IC12
22CV10
IC13
74HCT541
IC14
74HC574
IC15
LT1109
FLASH-CS*
BOOT
HWR*
LWR*
RD*
JEIDA-I/O-CS*
RESET*
JEIDA-DIR-CS*
PROGRAM-CS*
JEIDA-REG-CS*
JEIDA-PORT*
IRQ0*
WAIT*
PCMCIA-+12V
PCMCIA-VPP
VCC-PCMCIA
0C-574*
RDY/BSY*
INPACK
WP
CD1*
CD2*
BVD2
BVD1
RESET
JA21
JA22
JA23
JA24
JA25
WE/PGM
REG
RFSH
I/ORD
I/OWR
WAIT
VPP1
VPP2
VCC
GND
TC ELECTRONIC A/S
JEIDA CONNECTOR FOR ATAC
REMJEI20.SCH
February 6, 1995

Service Note		
Product	Description:	Service note no.
ATAC	Modifications for PC7001-2	708 10 00 01

IMPORTANT:

This note concerns units with serial no. lower than 660131.
All units are modified from factory.

Modifications:

1. R46 is removed.
2. R51 is removed.
3. R124 is removed
4. Q14 is removed.
5 Short circuit is made at Q14s position, between Base and Emitter.
6 Emitter of new transistor (BC557) is soldered to spot near IC7.
7. A new resistor (1kohm) is soldered to left pad of R51s position and to base of the new transistor.
8. Another new resistor (100 ohm) is soldered to upper pad of R46s position and to collector of the new transistor.

These modifications are necessary to obtain a fast communication to M5000.

9. Connection to one pin of TR1 is made with a short wire.

This modification is necessary to get proper backlight.

10. R123 is removed.
11. R126(10k ohm) is mounted from upper pad of R123s position to IC7 pin8.

These modifications are necessary for correct funtion of IC6 (DS36277)

Part list for : TC ATAC, Main board

Mounted from S/N: 660000 to 660130

PCB version: PC7001-2 Schematic version: PC700120

Ref	No	Type	TCCode	Component	Pos	Sch	PCB	Comments
R	1	MODST		10K			r0805	Encoder pull down.
R	2	MODST		10K			r0805	Encoder pull down.
R	3	MODST		10K			r0805	Encoder pull down.
R	4	MODST		10K			r0805	Encoder pull down.
R	5	MODST		10K			r0805	Encoder pull down.
R	6	MODST		10K			r0805	Encoder pull down.
R	7	MODST		10K			r0805	Encoder pull down.
R	8	MODST		10K			r0805	Encoder pull down.
R	9	MODST		10K			r0805	Encoder pull down.
R	10	MODST		10K			r0805	Encoder pull down.
R	11	MODST		1K			r0805	LED 1 pull up.
R	12	MODST		1K			r0805	LED 3 pull up.
R	13	MODST		1K			r0805	LED 2 pull up.
R	14	MODST		10K			r0805	MODE pull down
R	15	MODST		10K			r0805	BOOT pull down.
R	16	MODST		0 E			r0805	AD-gnd.
R	17	MODST		0 E			r0805	AD-vcc.
R	18	MODST		10 E			r0805	AD-ref.
R	19	MODST		470 E			r0805	LED 1 drive resistor.
R	20	MODST		470 E			r0805	LED 2 drive resistor.
R	21	MODST		470 E			r0805	LED 3 drive resistor.
R	22	MODST		470 E			r0805	LED 4 drive resistor.
R	23	MODST		470 E			r0805	LED 5 drive resistor.
R	24	MODST		470 E			r0805	LED 6 drive resistor.
R	25	MODST		470 E			r0805	LED 7 drive resistor.
R	26	MODST		470 E			r0805	LED 8 drive resistor.
R	27	MODST		470 E			r0805	LED 9 drive resistor.
R	28	MODST		470 E			r0805	Column 1 drive.
R	29	MODST		470 E			r0805	Column 2 drive.
R	30	MODST		470 E			r0805	Column 3 drive.
R	31	MODST		470 E			r0805	Column 4 drive.
R	32	MODST		470 E			r0805	Column 5 drive.
R	33	MODST		10K			r0805	Row 1 pull up.

R	34	MODST		10K			r0805	Row 2 pull up.
R	35	MODST		10K			r0805	Row 3 pull up.
R	36	MODST		10K			r0805	Row 4 pull up.
R	37	MODST		10K			r0805	Row 5 pull up.
R	38	MODST		10K			r0805	Row 6 pull up.
R	39	MODST		10K			r0805	Row 7 pull up.
R	40	MODST		10K			r0805	Row 8 pull up.
R	41	MODST		220 E			r0805	MIDI IN resistor.
R	42	MODST		220 E			r0805	MIDI OUT pull up.
R	43	MODST		220 E			r0805	MIDI OUT .
R	44	MODST		1K			r0805	MODI OUT drive resistor.
R	45	MODST		220 E			r0805	REMOTE out.
R	46	MODST		220 E			r0805	REMOTE out pull up.
R	47	MODST		100 E			r0805	REMOTE in pull up.
R	48	MODST		10K			r0805	
R	49	MODST		1K			r0805	Interface test relay .
R	51	MODST		10K			r0805	
R	52	MODST		120 E			r0805	RS-485 terminator.
R	53	MODST		4K7			r0805	
R	54	MODST		10K			r0805	Remote recieve pull up.
R	55	MODST		1K			r0805	
R	56	MODST		10K			r0805	
R	57	MODST		10K			r0805	Midi recieve pull up.
R	58	MODST		10K			r0805	Flash protect pull up.
R	59	MODST		10K			r0805	Jeida RFSH* pull up.
R	60	MODST		10K			r0805	Jeida WAIT* pull up.
R	61	MODST		10K			r0805	Jeida JA21 pull down.
R	62	MODST		10K			r0805	Jeida JA22 pull down.
R	63	MODST		10K			r0805	Jeida JA23 pull down.
R	64	MODST		10K			r0805	Jeida JA24 pull down.
R	65	MODST		10K			r0805	Jeida JA25 pull down.
R	66	MODST		10K			r0805	Jeida BVD2 pull up.
R	67	MODST		10K			r0805	Jeida BVD1 pull up.
R	68	MODST		10K			r0805	Jeida CD2* pull up.
R	69	MODST		10K			r0805	Jeida CD1* pull up.
R	70	MODST		10K			r0805	Jeida RDY/BSY* pull up.
R	71	MODST		10K			r0805	Jeida
R	72	MODST		10K			r0805	Jeida
R	73	MODST		100K			r0805	Jeida RESET pull up.

R	74	MODST		1K			r0805	
R	75	MODST		10K			r0805	
R	76	MODST		10K			r0805	Vpp +12 volt pull down.
R	77	MODST		1K			r0805	
R	78	MODST		33K2, 1%			r0805	With R79 AD vpp-pcmcia measure
R	79	MODST		10K0, 1%			r0805	+12v = +4v on ad.
R	80	MODST		10K			r0805	AD measure current backlight.
R	81	MODST		470 E			r0805	Bias for Q9 and Q10.
R	82	MODST		1K			r0805	Current CCFL. 1V=1ma.
R	83	MODST		2K21, 1%			r0805	With R84 AD measure contrast.
R	84	MODST		10K0, 1%			r0805	+4,1V=0V, +2,3=-10V
R	85	MODST		100 E			r0805	
R	86	MODST		1K			r0805	
R	87	MODST		10K			r0805	With R88 and IC16, gain=3,3gg
R	88	MODST		33K			r0805	
R	89	MODST		10K			r0805	With R90 and IC17. -15V=-13,75V
R	90	MODST		1K			r0805	
R	91	MODST		100 E			r0805	IC17 current limit.
R	92	MODST		0 E			r0805	Display Font Size = gnd = 8x8.
R	94	MODST		2K21, 1%			r0805	With R95 AD measure -15 volt.
R	95	MODST		10K0, 1%			r0805	+1,6volt = -13,75 volt
R	96	MODST		not used				
R	97	MODST		not used				
R	98	MODST		10K0, 1%			r0805	With R99 AD measure battery.
R	99	MODST		10K0, 1%			r0805	+1,5 volt = +3 volt.
R	100	MODST		10K0, 1%			r0805	With R101 AD measure input V.
R	101	MODST		1K00, 1%			r0805	+1,36 volt = +15 volt.
R	102	MODST		1K			r0805	With R103/Q13 measure battery.
R	103	MODST		10K			r0805	
R	104	MODST		10K			r0805	Battery current limit.
R	105	MODST		10K0, 1%			r0805	With R106 measure remote supply
R	106	MODST		1K00, 1%			r0805	+1,36 volt = +15 volt.
R	107	MODST		0 E			r0805	Watch dog. Open = disabled.
R	108	MODST		2K7			r0805	
R	109	MODST		2K10, 1%			r0805	With R109/IC18 = +5volt.
R	110	MODST		2K74, 1%			r0805	
R	111	MODST		100 E			r0805	AD measure +5 volt supply. By checking R109 and R110.
R	112	MODST		not used			r0805	Chip Select 0 pull up.
R	113	MODST		10K			r0805	

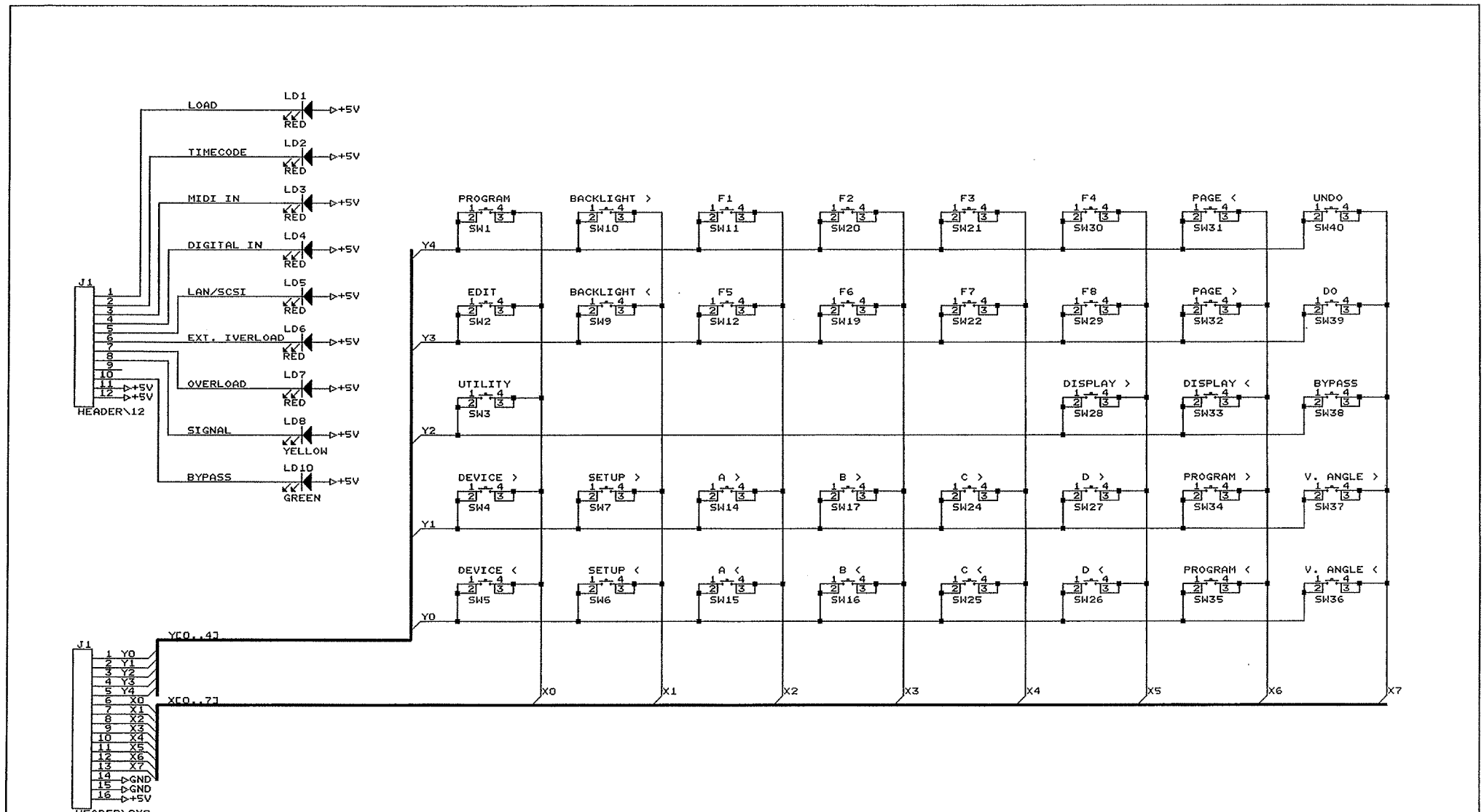
R	114	MODST		10K			r0805	Chip Select 2 pull up.
R	115	MODST		10K			r0805	Chip Select 3 pull up.
R	116	MODST		10K			r0805	Chip Select 4 pull up.
R	117	MODST		10K			r0805	Chip Select 5 pull up.
R	118	MODST		10K			r0805	Chip Select 6 pull up.
R	119	MODST		10K			r0805	Chip Select 7 pull up.
R	120	MODST		not used			r0805	
R	121	MODST		10K			r0805	SRAM pull up.
R	122	MODST		10K			r0805	RESET* pull down.
R	123	MODST		10K			r0805	
R	124	MODST		4K7			r0805	If old version M5000
All bipolar capacitors are X7R except other specified							c1210 houses could be 1206 to	
C	1			100nF			c1210	AD decoupling REF.
C	2			100nF			c1210	+5 volt decoupling.
C	3			100nF			c1210	+5 volt decoupling.
C	4			100nF			c1210	+5 volt decoupling.
C	5			100nF			c1210	+5 volt decoupling.
C	6			10pF, NP0			c0805	Xtal capasitors.
C	7			10pF, NP0			c0805	Xtal capasitors.
C	8			100nF			c1210	AD decoupling vcc and gnd
C	9			100nF			c1210	+5 volt decoupling.
C	10			100nF			c1210	+5 volt decoupling.
C	11			100nF			c1210	+5 volt decoupling.
C	12			100nF			c1210	+5 volt decoupling.
C	13			not used				
C	14			100nF			c1210	+5 volt decoupling.
C	15			not used				
C	16			not used				
C	17			100nF			c1210	+5 volt decoupling.
C	18			100nF			c1210	+5 volt decoupling.
C	19			100nF			c1210	+5 volt decoupling.
C	20			1uF/16V			TANTAL\B	Decoupling SRAM vcc.
C	21			22uF/20V			TANTAL\D	Decoupling vcc to jeida.
C	22			100nF			c1210	+5 volt decoupling.
C	23			100nF			c1210	+5 volt decoupling.
C	24			100nF			c1210	+5 volt decoupling.
C	25			22uF/20V			TANTAL\D	Jeida +5/+12 volt vpp decoupling

C	26			100nF			c1210	Capacitor for resonans in royer.
C	27			100nF			c1210	+5 volt decoupling display.
C	28			100nF			c1210	+5 volt decoupling.
C	29	CERAMIC		Murata DE0607 27pF/3.51kV			CAP\3M	for CFL backlight
C	30			22uF/20V			TANTAL\D	-15 volt
C	31			1uF/16V			TANTAL\B	Decoupling CCFL current feedback
C	32			1uF/16V			TANTAL\B	Integrate pwm from H8.
C	33			100nF			c1210	Capacitor for resonans in royer.
C	34	CERAMIC		Murata DE0607 27pF/3.51kV			CAP\3M	for CFL backlight
C	35	CERAMIC		Murata DE0607 27pF/3.51kV			CAP\3M	for CFL backlight
C	36			100nF			c1210	Input supply EMC protection.
C	37			100nF			c1210	Input supply EMC protection.
C	38			100nF			c1210	Input supply EMC protection.
C	39			100nF			c1210	+5 volt decoupling, reset.
C	40			220uF/35V.Max h=20mm, d=10mm			LYT\2M	Input capacitor.
C	41			10nF			c1210	+5 volt decoupling.
C	42	LYT		47uF/6v, OS-CON organisk			LYT\2M	Organisk (6x6,5mm)
C	43	LYT		220uF/10v, OS-CON organisk			LYT\2M	Organisk (10x10,5mm)
C	44			not used				
C	45			1uF/100V multilayer			CAP\2-4M	DGND afkobling til chassis
C	46			22uF/20V			TANTAL\D	Protect CCFL for overload
C	47			100nF			c1210	Protect battery
C	48	LYT		47uF/6v, OS-CON organisk			LYT\2M	Organisk (6x6,5mm)
C	49			not used			c0805	RESET* decoupling

IC	1	CPU		HD6413003TF 16MHz			QFP\112	CPU 1:1 type. Running 12 MHz.
IC	2	HCMOS		74HCT541			DIP20\sol	Read keyboard.
IC	3	HCMOS		74HC139			DIP16\so	CS for led and keyboard.
IC	4	HCMOS		74HC574			DIP20\sol	led driver.
IC	5	HCMOS		74HC574			DIP20\sol	led driver/key scan matrix
IC	6	DRIVER		DS36276			DIP8\so	RS485 driver with FAILSAFE
IC	7	OPTO		6N137			DIP8	Remote recieve opto.
IC	8	OPTO		6N137			DIP8	Midi recieve opto.
IC	9	SRAM		62256, 8x32Kb, <120ns			DIP28\sol	SRAM odd.
IC	10	FLASH		PA28F400BV-B120SVT/29F400B-12			DIP44\PSOP	FLASH 512KByte <120ns, 5volt boot
IC	11	SRAM		62256, 8x32Kb, <120ns			DIP28\sol	SRAM even.
IC	12	PAL		22CV10-25			DIP24\300	
IC	13	HCMOS		74HCT541			DIP20\sol	PCMCIA status latch. (read)
IC	14	HCMOS		74HC574			DIP20\sol	PCMCIA (write)
IC	15	LINEAR		LT1109CS8-12			DIP8\so	+12 volt pcmcia vpp, max50mA
IC	16	LINEAR		LM358M(AM)			DIP8\so	Contrast driver.
IC	17	LINEAR		LT1111CS8			DIP8\so	-15 volt buchboost dc-dc conv.
IC	18	LINEAR		Alt. : LT1076CQ , smd			smd	+5 volt buch 100Khz dc-dc conv. LT1076CT-#06, to-220\5
IC	19	LINEAR		LTC693CS, wide body			DIP16\SOL	Power monitor/Reset circuit
Q	1	TRANS		BC857, pnp			SOT-23	rs485,TXD
Q	2	TRANS		BC857, pnp			SOT-23	midi,TXD
Q	3	TRANS		BC847, npn			SOT-23	
Q	4	TRANS		BC857, pnp			SOT-23	Midi test relay driver.
Q	6	TRANS		BC847, npn			SOT-23	
Q	7	TRANS		FMMT720 Zetex, pnp			SOT-23	Jeida VPP switch, +5/12 volt
Q	8	TRANS		BC847, npn			SOT-23	Driver for VPP switch
Q	9	TRANS		FMMT619 Zetex, npn			SOT-23	Royer light control.
Q	10	TRANS		FMMT619 Zetex, npn			SOT-23	Royer light control.
Q	11	TRANS		BC847, npn			SOT-23	Driver for royer switch
Q	12	TRANS		FMMT720 Zetex, pnp			SOT-23	Royer supply switch
Q	13	TRANS		BC847, npn			SOT-23	Battery measure switch
Q	14	TRANS		BC847, npn			SOT-23	Battery measure switch

D	1	DIODE		LL4148		SOD80	midi-in protection
D	2	DIODE		LL4148		SOD80	Q4 protection
D	3	DIODE		LL5818		SOD87	+12volt SWPS for pcmcia
D	4	DIODE		LL4148		SOD80	Jeida BOOT.
D	5	DIODE		LL4148		SOD80	Jeida RESET.
D	6	DIODE		LL5818		SOD87	Royer sw ps.
D	7	DIODE		LL5818		SOD87	-15 volt SWPS for display.
D	8	DIODE		LL4148		SOD80	
D	9	DIODE		LL4148		SOD80	
D	10	DIODE		LL5818		SOD87	Input supply polarity protection
D	11	DIODE		LL5818		SOD87	+5 volt swps diode
D	12	DIODE		LL4148		SOD80	Clamp C46 PWM
D	13	DIODE		LL5818		SOD87	Power TO remote conn. for test
LD	1	LED		Ø3 RED		leaded	test led
LD	2	LED		Ø3 RED		leaded	test led
LD	3	LED		Ø3 RED		leaded	test led
X	1			12 MHz, HC49 (small type < 5mm)			H8-xtal. MPU-version 1:1
BT	1	BATTERY		CR2032			Lithium Battery, please refer to replacement procedure
TR	1			CTX110654			Royer CCFL transformator.
CL	1	FILTER		Murata NFM41R00C221			220pF
CL	2	FILTER		Murata NFM41R00C221			220pF
CL	3	FILTER		Murata NFM41R00C221			220pF
CL	4	FILTER		Murata NFM41R00C221			220pF
CL	5	FILTER		Murata NFM41R00C221			220pF
CL	6	FILTER		Murata NFM41R00C221			220pF
CL	7	FILTER		Murata NFM41R00C221			220pF
L	1	COIL		47uH/150mA : LQH3C470K04			Jeida EMC.
L	2	COIL		47uH/150mA : LQH3C470K04			+12 volt coil
L	3	COIL		58uH/1,2A, PULSE PE-53604			Royer forsyning (Layout til 3 coils),Coiltronics CTX 50 - 4P, (Sumida CD-105/CDR-125 47-100uH)
L	4	COIL		47uH/150mA : LQH3C470K04			-15 volt coil
L	5	COIL		58uH/1,2A, PULSE PE-53604			Input switch coil, ,Coiltronics CTX 50 - 4P, (Sumida CD-105/CDR-125 47-100uH)

EN	1	ENCODER					ENCOD	Encoder A
EN	2	ENCODER					ENCOD	Encoder B
EN	3	ENCODER					ENCOD	Encoder C
EN	4	ENCODER					ENCOD	Encoder D
EN	5	ENCODER					ENCOD	Encoder Program
FI	1			Murata: BNP002-02				EMC filter for input spuuly.
F	1	FUSE		1AT, Wickmann TR5-T No 19372				Fuse on input voltage.
RL	1			Takamisawa AS-5W-K				Remote test relay.
RL	2			Takamisawa AS-5W-K				Midi test relay.
SW	1			DIP sw 4-pol with sw on side.				BOOT=1, MODE=1, Eks. : SMK JKS 3120-0104
J	1			1x12 pin /				led pcb connector
J	2			2x8 pin / 8-10mm				key pcb connector
J	3			2x10 pin / 12-14mm				lcd display conn
JP	1			2 pin. 12mm between holes				CCFL backlight connector
CN	1			5 pole dinstik print				MIDI IN.
CN	2			5 pole dinstik print				MIDI OUT.
CN	3			7pole dinstik				REMOTE.
CN	4			68 pole jeida connector				PCMCIA
CN	5			DC plug. 2mm.				DC input.



t.c.electronic A/S		
Title	PC7002-3 KEYS AND LEDS FOR ATAC	
Size B	Document Number PC700231.SCH	REV 3.1
Date: May 1, 1997	Sheet 1 of 1	

Part list for : TC ATAC, LED/Key-Board

PCB version: PC7002-3				Schematic version: 3.1				
Ref	**No**	**Type**	**TCCode**	**Value/Name**	**Pos**	**Page**	**PCB**	**Comments**
SW	1	SWITCH	340020011	ITT KSA0M210		1		PROGRAM
SW	2	SWITCH	340020011	ITT KSA0M210		1		EDIT
SW	3	SWITCH	340020011	ITT KSA0M210		1		UTILITY
SW	4	SWITCH	340020011	ITT KSA0M210		1		DEVICE >
SW	5	SWITCH	340020011	ITT KSA0M210		1		DEVICE <
SW	6	SWITCH	340020011	ITT KSA0M210		1		SETUP <
SW	7	SWITCH	340020011	ITT KSA0M210		1		SETUP >
SW	9	SWITCH	340020011	ITT KSA0M210		1		BACKLIGHT <
SW	10	SWITCH	340020011	ITT KSA0M210		1		BACKLIGHT >
SW	11	SWITCH	340020011	ITT KSA0M210		1		F1
SW	12	SWITCH	340020011	ITT KSA0M210		1		F5
SW	14	SWITCH	340020011	ITT KSA0M210		1		A >
SW	15	SWITCH	340020011	ITT KSA0M210		1		A <
SW	16	SWITCH	340020011	ITT KSA0M210		1		B <
SW	17	SWITCH	340020011	ITT KSA0M210		1		B >
SW	19	SWITCH	340020011	ITT KSA0M210		1		F6
SW	20	SWITCH	340020011	ITT KSA0M210		1		F2
SW	21	SWITCH	340020011	ITT KSA0M210		1		F3
SW	22	SWITCH	340020011	ITT KSA0M210		1		F7
SW	24	SWITCH	340020011	ITT KSA0M210		1		C >
SW	25	SWITCH	340020011	ITT KSA0M210		1		C <
SW	26	SWITCH	340020011	ITT KSA0M210		1		D <
SW	27	SWITCH	340020011	ITT KSA0M210		1		D >
SW	28	SWITCH	340020011	ITT KSA0M210		1		DISPLAY >
SW	29	SWITCH	340020011	ITT KSA0M210		1		F8
SW	30	SWITCH	340020011	ITT KSA0M210		1		F4
SW	31	SWITCH	340020011	ITT KSA0M210		1		PAGE <
SW	32	SWITCH	340020011	ITT KSA0M210		1		PAGE >
SW	33	SWITCH	340020011	ITT KSA0M210		1		DISPLAY <
SW	34	SWITCH	340020011	ITT KSA0M210		1		PROGRAM >
SW	35	SWITCH	340020011	ITT KSA0M210		1		PROGRAM <
SW	36	SWITCH	340020011	ITT KSA0M210		1		VIEWING ANGLE <
SW	37	SWITCH	340020011	ITT KSA0M210		1		VIEWING ANGLE >
SW	38	SWITCH	340020011	ITT KSA0M210		1		BYPASS
SW	39	SWITCH	340020011	ITT KSA0M210		1		DO
SW	40	SWITCH	340020011	ITT KSA0M210		1		UNDO

LD	1	LEDBAR	317040012	HLMP-T200 (red)		1		LOAD
LD	2	LEDBAR	317040012	HLMP-T200 (red)		1		TIMECODE
LD	3	LEDBAR	317040012	HLMP-T200 (red)		1		MIDI IN
LD	4	LEDBAR	317040012	HLMP-T200 (red)		1		DIGITAL IN
LD	5	LEDBAR	317040012	HLMP-T200 (red)		1		LAN/SCSI
LD	6	LEDBAR	317040012	HLMP-T200 (red)		1		EXT. OVERLOAD
LD	7	LEDBAR	317040012	HLMP-T200 (red)		1		OVERLOAD
LD	8	LEDBAR	317040015	HLMP-T500 (green)		1		SIGNAL
LD	10	LEDBAR	317040014	HLMP-T300 (yellow)		1		BYPASS
J	1	PINHEADER	528005014	Header 2x8p male		1		
PCB	1	BOARD	594051011	PC7002-3				

Part list for mechanical parts in TC ATAC

Ref	No	TCCode	Pcs.	Description
Front section				
MP		708020011	1	ATAC Front panel w/ window
MP		591017011	1	Window for ATAC front panel
MP		336040011	1	LCD Display, DMF50316 NFU-FW LCD
MP		337001011	5	Black Metal knob for A,B,C,D and PROGRAM
MP		561010030	5	Screw Holocrome Pinol 3x6mm for Metal knob
MP		338000011	10	Black push button, small w/ arrow, for A,B,C,D and PROGRAM
MP		338001011	8	Black push button, big, for F1 to F8
MP		338003011	12	Blue push button, small, w/ arrow for DEVICE, SETUP, BACKLIGHT, VIEWING ANGLE, DISPLAY and PAGE.
MP		338004011	6	Blue push button, big, for UTILITY, PROGRAM, EDIT, BYPASS, UNDO and DO.
MP		566024030	4	Hexagonal Metal Spacer M3x22.2mm, between front panel and main board
Boards				
MP		708011311	1	ATAC Main service-PCB, ver. PC7001-3
MP		708012311	1	ATAC Switch service-PCB, ver. PC7002-3
MP		560002022	6	Screw PHPx 2.2 x 6.5 for Midi and Remote sockets
MP		563005030	22	Screw M3.0x6mm PHJX Pozidriv for spacers
MP		565052030	22	Shakeproof Washer 3.0mm for screw M3.0x6mm
MP		566018030	4	Hexagonal Metal Spacer M3x12mm for LCD
MP		566021030	2	Hexagonal Metal Spacer M3x15mm for LED PCB
MP		566022030	5	Hexagonal Metal Spacer M3x17mm for Key PCB
MP		566030030	5	Hexagonal Metal Spacer M3x05mm, between main board and chassis
MP		590021011	1	Insulating plate for PCB corner
MP		560013025	2	Screw M2.5x8mm for PCMCIA connector
MP		564001025	2	Nut for screw M2.5x8mm
Chassis				
MP		584035011	1	ATAC Chassis/cover
MP		576002011	1	Rubber pad for chassis/cover, 139.86X200.82
MP		563020030	4	Screw M3.0x4mm UHJX Pozidriv for chassis
MP		576004011	2	Black rubber foot
MP		565020040	2	Washer 4.0x 8.0x0.2 for rubber foot
MP		561003030	2	Screw Holocrome Button M3x16mm for rubber foot

Power Supply & cables				
MP		510028011	1	Power Supply, mains 230VAC (EU)
MP		510029011	1	Power Supply, mains 240VAC (UK)
MP		510030011	1	Power Supply, mains 110VAC (US)
MP		546010011	1	Split Cable, 0.1m, 5pin/5pin/2pin (DIN female/DIN male/DC female)
MP		546011011	1	Midi cable, 10m, 5pin, DIN Cable Male/Male
Optional cables				
MP		546011511		Cable, 25m, 5pin, DIN Cable Male/Male
MP		546012011		Cable, 50m, 5pin, DIN Cable Male/Male
MP		546012511		Cable, 75m, 5pin, DIN Cable Male/Male
MP		546013011		Cable, 100m, 5pin, DIN Cable Male/Male
MP		546013511		MULTAC cable 1m, 7pin, connects MULTAC to M5000/X
Miscellaneous				
MP		602023011		Packing for ATAC
MP		614002011		Disk w/ Software version 1.24
MP		708070111		Special PCMCIA service card w/ test/boot for ATAC
MP		606021011		ATAC Owners Manual, English
MP		605032011		ATAC Service Manual, English
Options				
MP		906MTAC00		MULTAC, Dual RS485 Interface for mutible ATAC/M5000 networks